2014 Atlantic Mackerel, Squid, and Butterfish Specifications and Management Measures
Environmental Assessment
Regulatory Impact Review
Initial Regulatory Flexibility Analysis

Prepared by the

Mid-Atlantic Fishery Management Council (Council) in collaboration with the

National Marine Fisheries Service (NMFS)

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1.0 EXECUTIVE SUMMARY & TABLE OF CONTENTS

The Mid-Atlantic Fishery Management Council (Council) made recommendations for 2014 specifications and management measures for the Atlantic **m**ackerel (referred to simply as "mackerel" hereafter), **s**quid (*Illex* and longfin), and **b**utterfish (collectively "MSB") fisheries at its June 2013 meeting and herein submits them to the National Marine Fisheries Service (NMFS). This document explains the potential actions and examines the impacts expected from implementation of these potential actions. The recommendations are consistent with the recommendations of the Council's Scientific and Statistical Committee (SSC), which may be accessed at: http://www.mafmc.org/ssc-meeting-documents/. The SSC's acceptable biological catch (ABC) recommendations account for scientific uncertainty such that overfishing of managed stocks is unlikely to occur. The preferred specifications described in this document also address management uncertainties and optimum yield considerations raised by the MSB Monitoring Committee (NMFS and Council staff) or otherwise brought to the Council's attention.

The proposed alternatives are expected to maintain positive benefits to the nation by maintaining the sustainability of the resources and should have no significant impacts on valued ecological components compared to the fishery as it was prosecuted under the 2013 specifications. Because none of the preferred alternatives are associated with significant impacts to the biological, social or economic, or physical environment, a "Finding of No Significant Impact" (FONSI) has been made.

In this document, catch quantities are the "***specifications***", commonly referred to as quotas. The longfin squid specifications are also divided up into trimesters, referred to as "***trimester quotas***" in this document. "***Management measures***" refer to other potential fishery controls such as closure thresholds, trips limits, and gear restrictions, which generally support the specifications and ensure that the specifications are not exceeded. A summary of changes for each species follows.

Illex Squid

In 2011 the Council recommended, and NMFS implemented, three year specifications for *Illex* squid for 2012-2014. Based on the SSC's reaffirmation of the 2014 ABC (see: http://www.mafmc.org/ssc-meeting-documents/), the Council also reaffirmed status quo specifications for 2014 (commercial quota = 22,915 mt) so there are no alternatives relative to *Illex* specifications in this document. For additional details on *Illex*, readers can consult the Environmental Assessment for the 2012 MSB Specifications, available at: http://www.nero.noaa.gov/regs/. *Illex* management will generally not be further discussed in this document as no additional *Illex* measures are contemplated. Other current *Illex* squid regulations are also summarized at: http://www.nero.noaa.gov/regs/info.html.

Longfin Squid[1]

In 2011 the Council recommended, and NMFS implemented, three year specifications for longfin squid for 2012-2014. Based on the SSC's reaffirmation of the 2014 ABC (see: http://www.mafmc.org/ssc-meeting-documents/), the Council also reaffirmed status quo specifications for 2014 (commercial landings limit = 22,445 mt), so there are no alternatives relative to longfin squid

1 There has been a scientific name change from *Loligo pealeii* to *Doryteuthis (Amerigo) pealeii*. To avoid confusion, this document will utilize the common name "longfin squid" wherever possible.

specifications in this document. For additional details on longfin squid specifications readers can consult the Environmental Assessment for the 2012 MSB Specifications, available at: http://www.nero.noaa.gov/regs/. The Council recommended one management measure change related to catch of longfin squid in the *Illex* fishery. This change, fully described in Section 5, increases the *Illex* fishery's ability to retain incidentally-caught longfin squid to minimize regulatory discarding. Other current longfin squid regulations are also summarized at: http://www.nero.noaa.gov/regs/info.html.

Mackerel

In 2012 the Council recommended, and NMFS implemented, three year specifications for mackerel for 2013-2015. Based on the SSC's reaffirmation of the 2014 ABC, the Council reaffirmed status quo specifications for 2014 (commercial quota = 33,821 mt and a recreational catch target = 2,443 mt) so there are no alternatives relative to mackerel specifications in this document. For additional details on mackerel specifications, readers can consult the Environmental Assessment for the 2013 MSB Specifications, available at: http://www.nero.noaa.gov/regs/.

This action proposes to set a cap on river herring (blueback and alewife) and shad (American and hickory) catch in the mackerel fishery. Together these four species are abbreviated as RH/S. The cap structure is being implemented via Amendment 14, and in Amendment 14 the Council decided that the actual value of the cap for any year would be set through the annual specifications.

The proposed cap, described in full in Section 5, would close the mackerel fishery if catch of RH/S in the mackerel fishery is predicted to reach 95% of 236 mt. 236 mt is the median of the values generated when the annual RH/S catch to all retained catch ratios on mackerel trips 2005-2012 (from observer data) are applied to the current quota (33,821 mt). The effect of this approach is that if the fishery can achieve a lower RH/S encounter rate than the median over 2005-2012, then it should be able to harvest the entire commercial mackerel quota. However if the fishery has a higher RH/S encounter rate, then the fishery will close before it reaches the current mackerel quota.

The encounter rates are determined based on observer data from mackerel trips, defined as trips landing more than 20,000 pounds of mackerel. This threshold was chosen because almost all mackerel are landed on trips landing more than 20,000 pounds of mackerel, and 20,000 pounds is the current incidental trip threshold. The encounter rate, or ratio of RH/S catch to landings on mackerel trips, is applied to total landings from similar trips (i.e. trips landing more than 20,000 pounds of mackerel) to estimate RH/S catch for the cap. The NMFS Northeast Regional Office will monitor and administer the cap, in cooperation with the NMFS Northeast Fishery Observer Program.

Whether the fishery closes would thus depend on both the amount of fish caught in the mackerel fishery as well as the RH/S encounter rate in that fishery. Since mackerel catches have been low in recent years, catches at recent levels (around 10,000 mt or less since 2010) should be available before triggering the cap unless the RH/S encounter rate was substantially higher than the 2005-2012 median. The cap creates a strong incentive to avoid RH/S if the mackerel fishery wants access to the full mackerel quota and not be closed by the RH/S cap. While mackerel catches have been low, mackerel catches can vary substantially from year to year so there is incentive to avoid RH/S in case substantial mackerel are available.

Other alternatives examine higher and lower mackerel cap amounts. While there are not absolute abundance estimates of RH/S available, the Council chose the preferred alternative so that the mackerel fishery can operate if it fishes relatively cleanly, but high annual RH/S catches in the mackerel fishery would be avoided, thus providing some benefit to RH/S. The approach, the expected operation, and expected impacts are consistent with Amendment 14, which described that the impacts of the cap (both biological and economic) depend on the amount the cap is set at, landings in the mackerel fishery, and the encounter rate of RH/S by the mackerel fishery. Amendment 14 also found that while there are no absolute abundance estimates are available for RH/S, controlling incidental catch of RH/S should have some benefits for RH/S runs/stocks.

Other current mackerel regulations are also summarized at: http://www.nero.noaa.gov/regs/info.html.

Butterfish

Based on advice from the Council's SSC, the Council recommended a butterfish ABC of 9,100 mt of butterfish for 2014. This would be an 8.3% increase from 2013. The increase would be used to increase the directed landings catch target from 2,570 mt to 3,200 mt. The butterfish discard cap for the longfin squid fishery would remain at 3,884 mt. These specifications set aside 10% of the ABC (10% of 9,100 mt = 910 mt) to get a catch target of 8,190 mt to buffer against management uncertainties. These specifications also set aside 1,106 mt to account for butterfish discards that may take place in other fisheries besides longfin squid. A minor change to align the incidental and Phase 3 butterfish trips limits is also considered. Other current butterfish regulations are also summarized at: http://www.nero.noaa.gov/regs/info.html. These measures were selected as preferred in order to achieve optimum yield and avoid regulatory discarding.

A qualitative summary of the expected impacts related to all of the status quo and preferred specification alternatives is provided in Table 1. A summary of the expected impacts related to the status quo and preferred management measure alternatives is provided in Table 2. For this fishery management plan (FMP), the no action and the status quo alternatives are equivalent because the regulations provide that the existing regulations remain in place until new regulations are implemented.

Table 1. Expected impacts of status quo and preferred specifications.
("+" signifies a positive impact, "-" a negative impact, and "0" a similar impact to the year before. "0/" before "+" or "-" indicates a likely small impact; Impacts for non-preferred alternatives are discussed in Section 7)

	Valued Ecosystem Components/Environmental Dimensions				
Specification Alternatives - JVP and TALFF are not listed in the table because they are both zero throughout. DAHs may be reduced to provide RSA quota as described in this document.	Managed Resource	Non-target Species	Human Communi-ties	Protected Resources	Essential Fish Habitat
Alt 4a - Butterfish No Action/Status Quo - ABC = 8,400mt; DAH = 2,570 mt; Butterfish Cap = 3,884mt	0	0	0	0	0
Alt 4b - Butterfish Preferred - ABC = 9,100mt; DAH = 3,200mt; Butterfish Cap = 3,884mt	0	0/-	+	0/-	0/-

Table 2. Expected impacts of status quo and preferred management measures.
("+" signifies a positive impact, "-" a negative impact, and "0" a similar impact to the year before. "0/" before "+" or "-" indicates a likely small impact; Impacts for non-preferred alternatives are discussed in Section 7)

	Valued Ecosystem Components/Environmental Dimensions				
Management measures besides specifications.	Managed Resource	Non-target Species	Human Communi-ties	Protected Resources	Essential Fish Habitat
Alt 1a - Status Quo/No Action - No RH/S Cap	0	0	0	0	0
Alt 1b - Preferred - 236 mt RH/S Cap	0	+	mixed	0/+	0
Alt 2a - Status Quo/No action -No changes to post closure longfin trip limits for *Illex* fishing	0	0	0	0	0
Alt 2b - Preferred - 15,000 pound longfin trip limit post Trimester 2 closure for Illex fishing	0	0/-	0/+	0/-	0/-
Alt 3a - Status Quo/No Action - No change to butterfish Phase 3 trip limit (500 pounds)	0	0	0	0	0
Alt 3b - Preferred -Change butterfish Phase 3 trip limit to 600 pounds (from 500)	0	0	0/+	0	0

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2.0 LIST OF ACRONYMS, ABBREVIATIONS, ETC.

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
ACT	Annual Catch Target
ASMFC	Atlantic States Marine Fisheries Commission or Commission
ATGTRT	Atlantic Trawl Gear Take Reduction Team
B	Biomass
CFR	Code of Federal Regulations
CV	coefficient of variation
DAH	Domestic Annual Harvest
DAP	Domestic Annual Processing
DPS	Distinct Population Segment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973
F	Fishing Mortality Rate
FMP	Fishery Management Plan
FR	Federal Register
GB	Georges Bank
GOM	Gulf of Maine
IOY	Initial Optimum Yield
M	Natural Mortality Rate
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act (as currently amended)
MSB	Atlantic Mackerel, Squid, Butterfish
MSY	Maximum Sustainable Yield
MT (or mt)	Metric Tons (1 mt equals about 2,204.62 pounds)
NE	Northeast
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service (NOAA Fisheries)
NOAA	National Oceanic and Atmospheric Administration
OFL	Overfishing Level
PBR	Potential Biological Removal
RH/S	River herrings (blueback and alewife) and shads (American shad and hickory shad)
RSA	Research Set-Aside
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SNE	Southern New England
SSC	Scientific and Statistical Committee
TALFF	Total allowable level of foreign fishing
TRAC	Transboundary Resource Assessment Committee
US	United States
VTR	Vessel Trip Report

Note: "Mackerel" refers to "Atlantic mackerel" unless otherwise noted.

3.0 LISTS OF TABLES AND FIGURES

3.1 List of Tables

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4.0 THE ANNUAL SPECIFICATION PROCESS

4.1 INTRODUCTION

The Council manages the mackerel, squid, and butterfish (MSB) fisheries with the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan (MSB FMP), pursuant to the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (MSA) as currently amended. The MSB FMP requires the Council to set annual specifications according to national standards specified in the MSA and has the following objectives: Enhance the probability of successful recruitment; Promote the growth of the commercial fishery; provide freedom and flexibility to all harvesters; provide marine recreational fishing opportunities; increase understanding of the conditions of the stocks and fisheries; and minimize harvesting conflicts. Related to these objectives, the Council has instituted a variety of management measures over the years in addition to annual specifications, which are summarized at http://www.mafmc.org/fmp/history/smb-hist.htm.

The Council recommended the butterfish specifications and associated management measures for one year (2014). Mackerel and the squids are in the middle of multi-year specifications and are not subject to change via this action in terms of their quotas. Some management measures are considered for mackerel, longfin squid, and butterfish, as further discussed below.

The specifications process this year began with recommendations from the Council's Scientific and Statistical Committee (SSC) for an acceptable biological catch (ABC) for butterfish that accounts for scientific uncertainty regarding stock status and productivity such that overfishing is unlikely. The SSC also endorsed continuing the multi-year specifications for mackerel and the squids. Annual catch limits are set equal to the ABCs, and if annual catch limits are exceeded paybacks will be required for mackerel and butterfish (the squids are exempted from paybacks due to their short lifecycle, but existing management measures are still designed to avoid overages - see http://www.nero.noaa.gov/regs/info.html for a summary of existing regulations by fishery). To avoid overages for any species, the Council recommended annual catch targets (ACTs) to provide a buffer for management uncertainties and other considerations (e.g. optimum yield) not otherwise addressed. Proactive accountability measures help ensure that catch targets are not substantially exceeded. Up to 3% of all four species may be reserved to fund research projects.

The Council's SSC met May 15-16, 2013 in Baltimore MD and recommended the ABC for butterfish and reaffirmed the ABC for the other species. The MSB Monitoring Committee met on May 28, 2013 to review the SSC's ABC recommendations and consider recommending additional measures to account for management uncertainty. The Council considered the SSC's and Monitoring Committee's recommendations, Council staff input, as well as public comments and testimony for specifications for all four species at its June 2013 meeting in Eatontown, NJ. Both the SSC and the Council also considered input from the Council's Squid-Mackerel-Butterfish Advisory Panel in the form of fishery-performance reports constructed by the Advisory Panel (see May 2013 meeting at: http://www.mafmc.org/ssc-meeting-documents/).

This document serves as the submission to NMFS of the Council's recommendations for 2014 MSB specifications and management measures, and contains related analyses supporting the recommendations. The analysis of the proposed measures' environmental impacts (and their significance) is discussed in accordance with the National Environmental Policy Act (NEPA) and National Oceanic and Atmospheric Administration Order 216-6 formatting requirements for an Environmental Assessment. The proposed alternatives are expected to maintain positive benefits to the nation by maintaining the sustainability of the resources and should have no significant impacts on valued ecological components compared to the fishery as it was prosecuted under the 2013 specifications. Because none of the preferred alternatives are associated with significant impacts to the biological, social or economic, or physical environment, a "Finding of No Significant Impact" (FONSI) has been made.

4.2 PURPOSE AND NEED OF THE ACTION

This action contains alternatives to address several issues. The first purpose is to set a catch cap for river herring and shad (RH/S) species within the mackerel fishery. This action is needed to reduce bycatch as required by the MSA and to meet objectives outlined in to this FMP to control RH/S catch in the mackerel fishery.

The second purpose of this document is to adjust the incidental catch limits of longfin squid within the *Illex* squid fishery during closures of the longfin squid fishery in Trimester 2 (May-August). This action is needed because current regulations can cause regulatory discarding of incidentally-caught longfin squid during *Illex* fishing trips, and the MSA requires minimizing discards to the extent practicable, including regulatory discards.

The third purpose is to align the Phase 3 (the "Phases" of the butterfish fishery are described below) butterfish incidental trip limits for butterfish moratorium permit holders with the butterfish incidental trip limits for longfin squid moratorium permit holders. This action is needed to prevent confusion about the incidental trip limits for all permit holders.

The final purpose of this action is to use the best available science to set one-year specifications for butterfish catch. This action is needed to prevent overfishing and achieve optimum yield. Optimum yield is defined as the amount of fish that will provide the greatest overall benefit to the nation based on the maximum sustainable yield as reduced by relevant economic, social and/or ecological factors.

5.0 WHAT ALTERNATIVES ARE CONSIDERED IN THIS DOCUMENT?

Introduction

The status quo alternative, what exists currently, is equivalent to the no action alternative because the current regulations contain a "roll-over" provision. This provision specifies that if the Regional Administrator fails to publish annual specifications before the start of the new fishing year, then the previous years' specifications remain in effect. The preferred alternatives were recommended by the Council after considering the recommendations of its SSC, recommendations from the MSB Monitoring Committee (Council and NMFS technical staff), and public testimony and comment given the requirements of the MSA and the MSB FMP. Several additional alternatives are also analyzed to create a "reasonable range" around the preferred alternative, as recommended by NEPA since analysis of a "reasonable range" of alternatives facilitates consideration of a variety of biological impacts on the stocks and economic impacts on fishing communities. Specifications (quotas) and other management measures are dealt with via separate "Alternative Sets," as described below.

5.1 Alternative Set 1: River Herring/Shad Cap for the Mackerel Fishery

These alternatives consider a range of river herring and shad catch (RH/S) caps for the mackerel fishery. The cap was selected by the Council in Amendment 14 to limit RH/S catch and Amendment 14 indicated that the specifications would implement the specific cap values and other operational details each year. Amendment 14 was partially approved on November 7, 2013 including full approval of the cap. A final rule is expected by early 2014. Additional details on other measures that were approved and disapproved may be found at: http://www.nero.noaa.gov/mediacenter/2013/11/partialapprovalam14msb.html.

The Amendment 14 EIS can be consulted for additional details on why the cap was selected (see: http://www.nero.noaa.gov/regs/2013/August/12smba14pr.html), but the basic rationale was that many river herring and shad runs are in poor condition and the mackerel fishery may catch substantial amounts of RH/S in some years – the analysis described in Appendix 2 of Amendment 14 found that Mid-Atlantic mid-water trawl fishing in Quarter 1, which is largely but not completely comprised of mackerel fishing, might be catching close to 2 million RH/S (mostly river herring) annually (using 5 fish per pound to convert weight [~168 mt average 2005-2010] to numbers of fish, per discussion with ASMFC staffer Kate Taylor). The cap was chosen as a way to directly limit RH/S catch while allowing fishermen the flexibility to figure out how to best avoid RH/S. While a final rule for Amendment 14 has not been published, the RH/S cap for the mackerel fishery had been approved by NOAA at the time this EA was completed.

Amendment 14 and its Environmental Impact Statement considered the impacts of RH/S caps (biological and socioeconomic) on the mackerel fishery, and specified that the operational aspects of the caps would be set during the specifications process. Amendment 14:

- Specified the cap should be on RH/S in the mackerel fishery.
- Specified that the cap would close the mackerel fishery to directed fishing once it was determined the cap was reached.

- Specified that the cap would use a methodology similar to the butterfish cap except this cap is on all RH/S catch, not just discards since most RH/S are retained in the high-volume mackerel fishery. As such, trips with observers that retain more than 20,000 pounds of mackerel are used to determine the ratio of RH/S caught to all species retained on observed cap mackerel trips. For all trips that land more than 20,000 pounds of mackerel, the current RH/S ratio is applied to their combined total landings to generate a total RH/S catch estimate for all mackerel trips.
- Stated that specifications would be used to set the cap amount, the incidental trip limit, the cap trip definition, and the cap closure threshold.
- Amendment 14 also resulted in the approval of a number of improved reporting and monitoring requirements including weekly Vessel Trip Reports (VTRs) for all MSB vessels, 48-hour notification for mackerel trips, Vessel Monitoring Systems (VMS) and VMS reporting for mackerel trips and longfin squid trips, 6-hour pre-landing notifications for mackerel landings over 20,000 pounds, expanded requirements for assisting at-sea observers, slippage reporting, and prohibitions on slippage (slippage due to safety, mechanical, or dogfish issues would be exempted). Observer coverage requirements with partial industry funding and a slippage cap were rejected due to legal and/or funding issues.
- While Amendment 14 specified that the actual cap amounts would be developed in the specifications process, it did explore some potential cap options for illustrative purposes. Amendment 14 considered caps for the mackerel fishery in the range of 85 mt -235 mt for river herring and 6 mt - 8 mt for shad. Because monitoring 6 mt - 8 mt of shad is not feasible, the specifications use a combined cap, and combining the above ranges results in a range of 91 mt - 243 mt. Amendment 14 also noted that whether or not the cap becomes constraining depends on the cap that is set, the RH/S encounter rates, and landings on mackerel trips. Using data from 2006-2010, Amendment 14 found that if a relatively high RH/S encounter rate occurs, mackerel landings could be limited to around 10,000 mt if the cap is set at the low end (near 91 mt). Lower encounter rates or higher caps were associated with less constraint, or no constraint at all for the mackerel fishery. While a different trip definition was used in Amendment 14 compared to the specifications, both approaches capture almost all mackerel landings so that difference is not critical. This specifications process uses a slightly different approach to examine possible caps, in that rather than using high/medium/low encounter rates applied to a portion of total estimated ocean RH/S catch (e.g. see table 1 in Amendment 14's EIS), the encounter rates from each year (and a broader range of years - 2005-2012) were used, and then high/low/mean/median extrapolated catches were examined (see Table 3 below). In either case, the principle and findings are generally consistent, in that setting a lower cap will tend to be more constraining, setting a higher cap will tend to be less constraining, and how constraining any cap will be is highly dependent on both the activity of the fishery (landings on mackerel trips) and the amount of RH/S encountered.

At the June 2013 Council meeting:

- The Council decided on a combined cap for river herring and shad because the relatively small amount of shad caught by the mackerel fishery and the precision of those estimates would make monitoring a separate cap for shad infeasible
- The Council discussed which trips the cap would apply to in terms of identifying "mackerel trips" and selected trips landing over 20,000 pounds of mackerel because analysis of dealer landings/weighout data demonstrated that almost all mackerel 2004-2012 (98.5%) were landed

by trips landing over 20,000 pounds of mackerel. Smaller trips (less than 20,000 pounds of mackerel) also had other species as the predominant species landed.

- The Council identified a post closure possession limit (20,000 pounds) to match the cap threshold of 20,000 pounds because of the same analysis.
- The Council decided on a closure threshold of when the cap catch is projected to be 95% of the cap because once the cap closes the fishery, additional trips that would count against the cap would not be expected. Using a projection should ensure a timely closure.
- While mackerel quotas were recently set for 3 years, this action only specifies a RH/S cap for 1 year (2014) because the Council would want to consider up-to-date biological information on river herring and shad for the following year given the lack of forward projecting abundance information (or any absolute abundance information).

The above operational items are consistent across all cap alternatives, so the range below focuses only on the cap amounts, which are most important in terms of impacts. To introduce the way the cap range was derived, table 3 is a reproduction of the table used by the monitoring committee and Council to evaluate potential caps.

To estimate the amount of RH/S that has been caught by the mackerel fishery in recent years, staff utilized the methodology used from the butterfish cap to examine what the mackerel fishery generated for RH/S cap catches looking back several years (see Table 3 below). An important factor to consider was that the RH/S estimates in Amendment 14 were quite imprecise in most cases, and while precision estimates are not available for the calculations in column G, they would likely be even more imprecise than the estimates generated in Amendment 14 (note the low number of observed trips/landings).

Column H approaches the question from a different perspective. It lists the annual cap amount that would be generated in each year given the yearly ratios and if the current mackerel quota (33,821 mt) had been caught. From staff's perspective these numbers were useful in terms of examining an appropriate range of options. 1,685 mt appears to be a cap number that would almost never close the mackerel fishery given the range of recent catch ratios and the current mackerel quota. The Monitoring Committee concluded that a cap of 1,685 mt or higher would be unlikely to match the intent of Amendment 14 to reduce/limit RH/S catch. Another way to utilize column H however is that the lower amounts in column H suggest caps that would allow the mackerel fishery to land its quota ***if*** it can maintain a low RH/S catch rate.

One benefit of using the ratio of RH/S catch raised to the quota versus catch (i.e. column H), is that the low mackerel catch in recent years would not make the cap artificially low (only the ratio matters, not absolute mackerel catch). 2005 was used as a start date because mid-water trawl observer sampling procedures were improved in 2005. 2012, the most recent year of data available at the time of decision making by the Council, was used as the end date so that a variety of fishery performances over recent years in terms of RH/S catch performance could be examined, and the Council wanted to control RH/S catch compared to recent RH/S performance. A voluntary industry program of RH/S avoidance was utilized by many larger Atlantic herring and Atlantic mackerel fishery participants in 2011 and 2012. If that program reduced RH/S from what would have otherwise occurred then the specified cap will be lower than if that program had not been in place. However, since the ratios in 2011 and 2012 were actually greater than the median, not including 2011 and 2012 would actually result in an even lower

cap despite the low mackerel landings (the actual ratio is the key driver for the Council's selected methodology, not the actual mackerel catch).

Column I lists 45% of the amounts of the total RH/S estimates produced from Amendment 14. 45% of those total RH/S amounts were caught in Quarter 1 on average from 2005-2010 (34% from the Mid-Atlantic and 11% from New England). The Amendment 14 analysis stratified RH/S catch by year, gear, RH/S species, quarter, and region. While the Amendment 14 analysis was not done the same way that the cap can be calculated for purposes of monitoring a specific fishery, these numbers still provided a useful reference point for recent RH/S catch. While 2007 appears to represent a divergence between the Amendment 14 analyses (see table below) and the cap estimates in the above table, given the CVs (estimates of uncertainty) in the Amendment 14 analysis, the likely imprecision in the table below, and given the mackerel cap trips consist of a different draw of trips compared to the Amendment 14 analyses, the difference is not that large given the imprecision. While not calculated, the CVs for the mackerel fishery catches are likely to be less precise than the Amendment 14 analysis since less observer trips would likely be used in the analysis (unless observer coverage is increased). The achieved CVs for the cap will be examined by the MSB monitoring committee as part of the annual specifications process.

Council and NMFS technical staffs continue to investigate how a regional cap spanning multiple fisheries might work, and such a cap could use the stratified estimation approach from Amendment 14. However, for purposes of limiting one fishery, which is what the MAFMC has the authority to do through Amendment 14, a ratio approach tied to mackerel trip definitions must be used, and this is how the values in columns G and H were derived. From Table 3, the options considered and detailed below are 1b (236 mt, the median value when RH/S ratios are applied to the current quota), 1c (119 mt, the median value of actual RH/S catch extrapolations, and 1d (456 mt, the mean value when RH/S ratios are applied to the quota). All of these options were discussed and debated at the June Council meeting.

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Table 3. River Herring and Shad Caps Range

A	B	C	D	E	F	G	H	I
Year	Mackerel Landings	Total Landings on Mackerel Trips (the difference is mostly from Atl. Herring)	% of RH/S catch vs all catch on observed mackerel trips	Number of observed trips that ratio is derived from	Percent of total mackerel landed that was observed by those trips	Amount RH/S Estimated to be caught by mackerel trips based on methods used for butterfish and other similar caps	Amount of RH/S that would have been caught for a given year's ratios if fishery had caught the current mackerel quota (33,821 mt)	45% of total RH/S catch from Amendment 14 analysis - 45% was the average amount of RH/S that Quarter 1 was responsible for 2005-2010
2005	42,270	44,155	0.38%	12	3%	167	134	301
2006	56,860	59,976	0.51%	14	5%	308	183	130
2007	25,546	31,441	4.05%	9	3%	1,273	1,685	328
2008	21,734	28,438	0.46%	16	13%	132	206	332
2009	22,635	30,891	0.27%	17	10%	84	126	195
2010	9,877	15,063	0.52%	20	16%	78	266	132
2011	531	1,095	0.54%	5	29%	6	377	na
2012	5,332	8,408	1.26%	14	12%	106	674	na
Mean	23,098	27,433	1.00%	13	11%	269	456	236
Median	22,184	29,665	0.51%	14	11%	119	236	248
High	56,860	59,976	4.05%	20	29%	1,273	1,685	332
Low	531	1,095	0.27%	5	3%	6	126	130

Alternative 1a – Status Quo and No Action Due to Roll-Over Provisions

Since this is the first year of the river herring and shad (RH/S) cap for the mackerel fishery and there is currently no cap in place, the status quo/no action would be to continue the mackerel fishery without any cap. The mackerel fishery would continue to operate under limited access and basic quota management as described at: http://www.nero.noaa.gov/regs/info.html.

Alternative 1b (Preferred) – 236 metric tons (mt) River Herring and Shad Cap

Once cap trips were estimated to have caught 95% of the 236 mt RH/S cap, then the directed mackerel fishery would be closed and a 20,000 pound mackerel trip limit would be instituted, as would currently occur if the directed mackerel fishery closes.

The estimated median amount of RH/S that would have been caught had the commercial mackerel fishery landed its current quota of 33,821 mt over 2005-2012 based on analysis of observer and landings data (see Table 3 above) is 236 mt. In some of those years the mackerel fishery landed more than 33,821 mt (2005 and 2006) but in most years the mackerel fishery landed less than 33,821 mt (2007-2012) (see Table 14). By using 236 metric tons, the mackerel fishery could likely catch its full mackerel quota if it achieves a relatively low RH/S encounter rate (relative to 2005-2012), but would be shut down earlier if it does not. By restricting the mackerel fishery in years when high RH/S encounter rates occur, this quota would reduce RH/S catches in those years of high encounter rates.

This alternative is preferred because it creates a strong incentive for the fleet to avoid RH/S, allows for the possibility of the full mackerel quota to be caught if the fleet can avoid RH/S, and would likely reduce RH/S catches over time compared to what would occur without a cap given recent data.

Alternative 1c – 119 MT metric tons (mt) River Herring and Shad Cap

The median amount of RH/S estimated to have been actually caught by the commercial mackerel fishery over 2005-2012 based on analysis of observer and landings data (see Table 3 above) is 119 mt. By using 119 metric tons, the mackerel fishery would have to achieve a slightly lower RH/S encounter rate than was observed in the lowest year 2005-2012 (2009) in order to catch its full quota (note all of the values in column H of table 3 are greater than 119 mt). If the mackerel fishery achieved the lowest ratio observed (2009) then it would be able to catch most of its quota, but higher rates would mean the mackerel fishery would be closed earlier, depending on the exact RH/S ratio observed.

Alternative 1d – 456 MT metric tons (mt) River Herring and Shad Cap

The estimated mean amount of RH/S that would have been caught had the commercial mackerel fishery landed its current quota of 33,821 mt over 2005-2012 based on analysis of observer and landings data (see Table 3 above) is 456 mt. By using 456 metric tons, the mackerel fishery would only have to avoid ratios similar to those observed in the two highest years (2007 and 2012) in order to not get shut down because of the RH/S cap. Ratios similar to or higher than 2007 and 2012 would result in closures, and the extent of the closure would depend on the exact ratio.

5.2 Alternative Set 2: Longfin Squid Regulatory Management Measures- Trimester 2 Longfin Squid Limit for Illex Fishing

Background

The annual longfin squid quota is divided into three 4-month trimesters (January-April, May-August, and September-December). The quota divisions are 43% to Trimester 1, 17% to Trimester 2, and 40% to Trimester 3. While originally based on historical catch and designed to make sure different fishery participants had access at certain points in the year, spreading catch throughout the year also has biological benefits for a short-lived species such as longfin squid (no sub-annual cohort can have the entire annual quota's worth of biomass removed). Periods of intense longfin fishing can occur at any point in the year, and activity patterns vary of year to year.

The *Illex* fishery has an annual calendar-year quota but only operates from May-October as that is when *Illex* squid are available to the U.S. fishery. The *Illex* fishery has not closed in recent history.

If the longfin squid fishery closes in Trimester 2 (May-August), as occurs occasionally (see 6.6.4), the *Illex* fishery is usually operating at that time. Sometimes the longfin fishery never closes in Trimester 2, but closures can occur in July or August during prime *Illex* fishing. As discussed in detail below, if the longfin fishery is closed, most longfin caught during *Illex* fishing must be discarded until the longfin fishery re-opens September 1 for Trimester 3. By the time the longfin fishery might close late in the year during Trimester 3 (November or December), the *Illex* fishery would be finished anyway, so this is really just a Trimester 2 issue.

Alternatives

These alternatives consider a range of longfin squid trip limits for *Illex* moratorium vessels while they are fishing for *Illex* in Trimester 2 when the directed longfin squid fishery has closed. The rationale for considering changes to the status quo (2,500 pounds) is that in 2012, fishermen reported that to remain in compliance with longfin squid regulations, they sometimes had to discard large quantities of longfin squid while *Illex* fishing during longfin squid Trimester 2 after that trimester closed (July 10-August 31). Also, currently day trips may catch 2,500 pounds of longfin squid per day (since each trip is one day) after closures, but offshore vessels that make multi-day trips are also subject to the same 2,500 pound total trip incidental longfin squid limit during closures. A larger post-closure limit would accommodate the multi-day nature of *Illex* trips.

While there was insufficient observer data to independently confirm the discarding in 2012, from 2008-2012 there were 82 trips total trips that were observed where more than 10,000 pounds of *Illex* were retained (usually much more - the average *Illex* kept per observed trip was over 175,000 pounds) (Northeast Fisheries Observer Program Data, unpublished). The fact that most of these trips did not occur during a longfin squid closure is not critical since they demonstrate the capacity for longfin squid catch during *Illex* fishing. The observer data was focused on because neither the dealer data nor Vessel Trip Report (VTR) data provide validated information on both retained and discarded catch.

On those trips, an average of slightly over 15,000 pounds of longfin squid was also caught. While most of this was retained, this clearly demonstrates that during a longfin squid closure the potential for regulatory discarding could at least occasionally occur since the post-closure longfin squid trip limit is 2,500 pounds per trip. Increasing the post-closure trip limit for longfin squid would reduce the potential for regulatory discarding. To help ensure that vessels are actually *Illex* fishing when they utilize this provision, the increased trip limit would only apply if they had 10,000 pounds of *Illex* already onboard, and vessels could not fish inside the *Illex* mesh exemption line at 50 CFR 648.23(a)(3) (Figure 1) once they had more than 2,500 pounds of longfin squid onboard during a Trimester 2 longfin squid closure. Restricting the proposed possession limit increase to areas beyond the *Illex* mesh exemption line should help prevent vessels returning from *Illex* fishing from targeting longfin squid in inshore areas after a Trimester 2 closure.

Amendment 9 to the FMP considered similar issues but took no action because of concerns about administering such a measure. Specifically, a previous attempt to implement such measures in the 2007 specifications was rejected because it used an unenforceable percentage based criteria for acceptable longfin squid on *Illex* fishing trips. That approach is not used in this case - the changes are trip limit increases as long as certain non-percentage based criteria are met. Also, there have been concerns about enforcing the *Illex* mesh exemption line as a demarcation where vessels can use the higher trip limit. However, since this provision would only apply to vessels that also had longfin squid moratorium permits, and those permits will soon have VMS requirements related to Amendment 14, any vessel taking advantage of this measure will have VMS monitoring and reporting.

While the recent observer data described above shows that longfin squid can be caught in substantial amounts during *Illex* fishing, Amendment 9 (MAFMC 2008) conducted additional analysis that found similar results. It found that both observer program and VTR data indicated that regulatory discarding of longfin squid occurred during longfin squid fishery closures and that when longfin squid fishery closures occurred in June through October, longfin squid discards were primarily associated with the

Illex fishery. Analysis of 1996-1999 dealer data also revealed that almost 7% of *Illex* trips had average longfin squid landings of 14,670 pounds or higher.

Amendment 9 also found that restricting the higher trip limit to deeper waters would likely help avoid targeting on longfin squid, and concluded that 80 fathoms would provide the best separation. While the *Illex* mesh exemption line proposed to be utilized approximates a 50 fathom demarcation, it is an existing demarcation and adding additional area-based criteria would complicate enforcement. Staff will analyze vessel activity in coming years to determine if vessels appear to be using the trip limit as a way to target longfin squid during closures rather than avoiding regulatory discarding.

As an additional analysis, staff examined 2010-2012 trips where more than 10,000 pounds of *Illex* was landed during Trimester 2 (May-August) and where *Illex* made up more than half of the total landings. There were 151 such trips. Of these trips, 119 had some longfin squid. While the average was about 2,400 pounds, there were 18 trips that reported over 2,500 pounds of longfin squid, and 4 trips over 10,000 pounds. However, 2011 and 2012 both had Trimester 2 closures so some catches of longfin squid over 2,500 pounds were likely discarded during those years. The point is that substantial longfin squid catches occur related to *Illex* fishing, and the goal is to avoid regulatory discarding when they do occur.

Figure 1. Illex Mesh Exemption Area and coordinates.

N. Lat.	W. Long.
43°58.0'	67°22.0'
43°50.0'	68°35.0'
43°30.0'	69°40.0'
43°20.0'	70°00.0'
42°45.0'	70°10.0'
42°13.0'	69°55.0'
41°00.0'	69°00.0'
41°45.0'	68°15.0'
42°10.0'	67°10.0'
41°18.6'	66°24.8'
40°55.5'	66°38.0'
40°45.5'	68°00.0'
40°37.0'	68°00.0'
40°30.0'	69°00.0'
40°22.7'	69°00.0'
40°18.7'	69°40.0'
40°21.0'	71°03.0'
39°41.0'	72°32.0'
38°47.0'	73°11.0'
38°04.0'	74°06.0'
37°08.0'	74°46.0'
36°00.0'	74°52.0'
35°45.0'	74°53.0'
35°28.0'	74°52.0'

Alternative 2a – Status Quo and No Action

Under the status quo, all moratorium-permitted vessels would continue to be subject to the 2,500 pound post-closure longfin squid fishery trip limit during Trimester 2 once the directed Trimester 2 longfin squid fishery closes. This limit is designed to accommodate incidental and small-scale longfin squid catches that occur once the directed fishery closes.

Alternative 2b (Preferred) – 15,000 pound Trimester 2 Post-Closure Longfin Trip Limit for Illex Fishing.

During Trimester 2, there would be a 15,000 pound longfin squid trip limit for *Illex* moratorium vessels that also have longfin squid moratorium permits if they are fishing seaward of the *Illex* mesh exemption line and have more than 10,000 pounds of *Illex* onboard. These vessels would have to stow all fishing gear inside the mesh exemption line if they have more than 2,500 pounds of longfin squid onboard.

This alternative is preferred because it would reduce the occurrence of regulatory discarding of longfin squid. Post-closure longfin squid trip limits greater than 15,000 pounds would further reduce the chance of forcing regulatory discarding but could lead to excessive targeting of longfin squid during closures. Post-closure longfin squid trip limits lower than 15,000 pounds would reduce the likelihood of excessive targeting of longfin squid during closures but increase the chances of forcing regulatory discarding.

Alternative 2c – 10,000 pound Trimester 2 Post-Closure Longfin Squid Trip Limit for Illex Fishing.

During Trimester 2, there would be a 10,000 pound longfin squid trip limit for *Illex* moratorium vessels that also have longfin squid moratorium permits if they are fishing seaward of the *Illex* mesh exemption line and have more than 10,000 pounds of *Illex* onboard. These vessels would have to stow all fishing gear inside the mesh line if they have more than 2,500 pounds of longfin squid onboard.

5.3 Alternative Set 3: Match the Phase 3 and Incidental Trip Limits

The butterfish fishery for vessels with longfin squid/butterfish moratorium permits operates in a 3-phase system whereby the fishery starts (1) out the year with no trip limits for mesh at least 3", then (2) is subject to a 5,000 pound trip limit for mesh at least 3", and finally (3) is subject to a backstop incidental trip limit of 500 pounds to help ensure that the Domestic Annual Harvest (DAH) landings limit is not exceeded. The trip limit is 2,500 pounds if using less than 3" mesh until the 500 pound 3rd phase is activated. The transition from one phase to another is set by the Council to allow some directed fishing with no trip limit initially and then lower levels as the quota is utilized.

These alternatives consider a range of alternatives to align the phase 3 butterfish trip limit associated with the longfin squid/butterfish moratorium permits and the incidental butterfish trip limit associated with the squid/butterfish incidental catch permit. Currently the squid/butterfish incidental catch permit trip limit is 600 pounds and the phase 3 butterfish trip limit for moratorium permits is 500 pounds. Since the phase 3 trip limit essentially serves as an incidental trip limit for moratorium permits, it could cause confusion to have these two trip limits be different. Making them the same should reduce confusion about trip limits should the butterfish moratorium fishery enter phase 3.

Alternative 3a – Status Quo and No Action

Under the status quo there would be no changes to the 500 pound phase 3 butterfish trip limit for longfin/squid butterfish moratorium permits, which is the backstop phase to avoid DAH (landings limit) overages. The squid/butterfish incidental catch permit would continue to have a 600 pound trip limit at all times. All other management measures would also remain the same (see http://www.nero.noaa.gov/regs/info.html for a summary).

Alternative 3b (Preferred) – Change the phase 3 trip limit to 600 pounds

The phase 3 butterfish trip limit for longfin/squid butterfish moratorium permits, which is the backstop phase to avoid DAH overages, would change to 600 pounds. This matches the current trip limit for the squid/butterfish incidental catch permit. Having the phase 3 trip limit and the incidental trip limits be the same should reduce regulatory confusion as both serve the same purpose - to allow incidental landings but discourage directed fishing. All other management measures would also remain the same (see http://www.nero.noaa.gov/regs/info.html for a summary).

This alternative is preferred because it aligns the phase 3 and incidental trip limits without lowering the incidental trip limit. Lowering the incidental trip limit could have the effect of converting butterfish catch that would currently be retained into discards. Both 500 and 600 pound trips limits are likely to be effective deterrents against substantial directed fishing on butterfish. Given the closure triggers and buffers utilized in this fishery, neither limit would be likely to contribute to substantial quota overages.

Alternative 3c – Change the incidental trip limit to 500 pounds.

The phase 3 butterfish trip limit for longfin squid/butterfish moratorium permits, which is the backstop phase to avoid DAH overages, would remain 500 pounds and the squid/butterfish incidental permit trip limit would be lowered to 500 pounds. Having the phase 3 trip limit and the incidental trip limits be the same should reduce regulatory confusion as both serve the same purpose - to allow incidental landings but discourage directed fishing. All other management measures would also remain the same (see http://www.nero.noaa.gov/regs/info.html for a summary). Lowering the incidental trip limit could have the effect of converting currently retained butterfish catch into discards.

5.4 Alternative Set 4: Butterfish Specifications

The overall goal of the butterfish specifications is to account for all butterfish catch such that the ABC provided by the SSC is not exceeded and optimum yield is achieved. The ABC recommended by the SSC is 9,100 mt for 2014 (see http://www.mafmc.org/s/May-2013-SSC-ReportV2.pdf for details). The following alternatives consider status quo, preferred, low ABC, and high ABC alternatives.

There is a framework (Framework 8) pending that will likely take affect after these specifications have been finalized. It seeks to accomplish two goals: 1) to increase accountability for the butterfish cap in Trimester 2 by making a firm allocation of the cap to Trimester 2 (currently Trimester 2 only closes if 75% of the total cap is utilized) and 2) to allow NMFS to shift quota between the butterfish cap on the longfin squid fishery and butterfish DAH/landings near the end of the year to minimize the risk of one closing (directed butterfish fishing or longfin squid fishing because of the cap) while substantial quota is left unused in the other. A separate notice and proposed rule will be published for changes related to that framework, but since it mostly involves how quota is used administratively within a year, it would not substantially impact the overall analysis of the annual specifications.

Alternative 4a – Status Quo and No Action Due to Roll-Over Provisions in FMP

Table 4. Status Quo/No Action Butterfish Specifications Summary – 4a

Alternative 4a for Butterfish - No action and status quo (all numbers are in metric tons)	
Specification	Butterfish
Overfishing Limit (OFL)	16,800
Total Acceptable Biological Catch (ABC) from SSC = ACL	8,400
Commercial Annual Catch Target (10% less than ACL to account/buffer for management uncertainty)	7,560
Landings or "Domestic Annual Harvest (DAH)" (66% less than Annual Catch Target to account for expected discards)	2,570
Butterfish Cap (set at 75% of ABC)	3,884

In the table above, the 8,400 mt ABC was the recommendation for 2013 by the SSC. The 10% deduction for management uncertainty used to arrive at the ACT is set by the Council to avoid ACL overages. The most likely cause of an ACL overage with butterfish would be unexpectedly high discard rates. Landings (maximum of 2,570 mt) plus the butterfish discard cap (maximum of 3,884 mt) equals 6,454 mt. The difference between 6,454 mt and the 7,560 mt ACT (1,106 mt) allows for discards in other fisheries to occur without even exceeding the ACT, presumably making ACL overages very unlikely. Like last year, quota available to Joint Venture Processing is zero and quota available for foreign fishing, the total allowable level of foreign fishing (TALFF) is also zero since butterfish TALFF is only specified as a bycatch allowance if mackerel TALFF is specified, and no mackerel TALFF is specified.

The DAH (landings) would be utilized in a 3-Phase system that allows some directed fishing without trip limits initially (for vessels using 3-inch or greater mesh), and then implements a 5,000 pound trip

limit for a time, and then implements a 500 pound trip limit as a backstop (or a 600 pound trip limit if alternative 3b is chosen). Incidental permits have a 600 pound trip limit year-round. The amounts available in each phase change as the year progresses such that more quota is shifted to the earlier, less restricted phases as the year progresses since less of a backstop is required as there becomes less time until the beginning of the next year. The status quo allocations for the phases are listed in the table below. All other measures besides those contemplated in this action, and described at http://www.nero.noaa.gov/nero/regs/infodocs/MSBInfoSheet.pdf, would remain the same.

Table 5. Butterfish Phases under 4a

Months	Phase 1 Available Landings	Phase 2 Available Landings	Phase 3 Available Landings	Total
Jan/Feb	1,028	463	1,079	2,570
Mar/Apr	1,208	437	925	2,570
May/Jun	1,414	411	745	2,570
Jul/Aug	1,619	386	565	2,570
Sep/Oct	1,825	360	386	2,570
Nov/Dec	2,005	334	231	2,570

Alternative 4b – Preferred

Table 6. Summary of Preferred Butterfish Specifications – 4b

Alternative 4b for Butterfish - Preferred (all numbers are in metric tons)	
Specification	Butterfish
Overfishing Limit (OFL)	18,200
Total Acceptable Biological Catch (ABC) from SSC = ACL	9,100
Commercial Annual Catch Target (10% less than ACL to account/buffer for management uncertainty)	8,190
Landings or "Domestic Annual Harvest (DAH)"	3,200
Butterfish Cap	3,884

In the table above, the 9,100 mt ABC is the recommendation for 2014 by the SSC (see preferred ABC summary below). The 10% deduction for management uncertainty used to arrive at the ACT is set by the Council to avoid ACL overages. The most likely cause of an ACL overage with butterfish would be unexpectedly high discard rates. Landings (maximum of 3,200 mt) plus the butterfish discard cap (maximum of 3,884 mt) equals 7,084 mt. The difference between 7,084 mt and the 8,190 mt ACT (1,106 mt) allows for discards in other fisheries to occur without even exceeding the ACT, presumably making ACL overages unlikely. Like last year, quota available to Joint Venture Processing is zero and quota available for foreign fishing, the total allowable level of foreign fishing (TALFF) is also zero since butterfish TALFF is only specified as a bycatch allowance if mackerel TALFF is specified, and no mackerel TALFF is specified. These specifications also include that up to 2% of the ACT (164 mt) may be used to cover butterfish discarding related to longfin squid research set-aside fishing, and would be accounted for within the 1,106 mt unallocated portion of the ACT that covers butterfish discards in other fisheries.

The DAH would be utilized in a 3-Phase system that allows some directed fishing without trip limits initially (for vessels using 3-inch or greater mesh), and then implements a 5,000 pound trip limit for a time, and then implements a 500 pound trip limit as a backstop (or a 600 pound trip limit if alternative 3b is chosen). Incidental permits have a 600 pound trip limit year-round. The amounts available in each phase change as the year progresses such that more quota is shifted to the earlier, less restricted phases as the year progresses since less of a backstop is required as there becomes less time until the beginning of the next year. The preferred allocations for the phases are listed in the table below. All other measures besides those contemplated in this action, and described at http://www.nero.noaa.gov/nero/regs/infodocs/MSBInfoSheet.pdf, would remain the same.

Table 7. Butterfish Phases under 4b

Months	Phase 1 Available Landings	Phase 2 Available Landings	Phase 3 Available Landings	Total
Jan/Feb	1,658	463	1,079	3,200
Mar/Apr	1,838	437	925	3,200
May/Jun	2,044	411	745	3,200
Jul/Aug	2,249	386	565	3,200
Sep/Oct	2,455	360	386	3,200
Nov/Dec	2,635	334	231	3,200

Preferred ABC Summary

The rationale for the SSC's 2014 ABC recommendation of 9,100 is documented in the SSC's May 2013 report (available at: http://www.mafmc.org/ssc-meeting-documents/) and summarized below.

Given the absence of a usable assessment (a new assessment is underway), the NEFSC expanded NEFSC fall trawl survey data (the survey that best samples butterfish) to a range of total swept area biomasses based on ranges of reasonable assumptions regarding catchability, and also investigated likely fishing mortalities from various catch levels. Drs. Tim Miller, Charles Adams, and Paul Rago collaborated on the analysis (Miller et al. (2013)) summarized herein and available at: http://www.mafmc.org/ssc-meetings/2013/april-may.

The results of the Miller et al. (2013) analysis comported well with the 2010 assessment results (NEFSC 2010) and strongly supported that a catch of 9,100 mt would be extremely unlikely to cause overfishing if the 2014 biomass of butterfish is similar to butterfish biomass over 2006-2012. Additional analysis via bootstrapping examined the range of probable fishing mortalities that would result from relatively conservative assumptions about butterfish biomass. Using Patterson 2002's guidance for small pelagic species of keeping to an F:M (fishing mortality to natural mortality) ratio of 67% and an assumed M of 0.8 (which translates to an F = 0.536 for an overfishing proxy), the analysis suggested that catches of 18,200 mt would only lead to overfishing (F > = 0.536) under the most extreme assumptions. The SSC therefore adopted 18,200 as a proxy OFL and recommended an ABC of half that amount, 9,100 mt. The relatively large 50% buffer was used to account for uncertainty. There has been some concern that Amendment 10 to the MSB FMP implemented a rebuilding plan for butterfish that required that the ABC be set equal to yield associated with applying F = 0.1 to the current butterfish biomass estimate, and that an ABC of 9,100 mt could violate that rebuilding plan despite its very conservative approach. This argument is invalid for two reasons:

First, automatically implementing an ABC based on applying F = 0.1 to the current estimate of butterfish biomass would violate National Standard 2 because such an ABC would not be based on the best available scientific information. The best available scientific information (NEFSC 2010) found the conclusions of the assessment that Amendment 10 (and the F = 0.1 rule) was based on (NEFSC 2004) to be invalid. NMFS subsequently changed butterfish's status from overfished to unknown.

As part of its proceedings to recommend a butterfish ABC to the Council, the SSC certified its advice as utilizing the best available science and as likely having a low probability of causing overfishing. The SSC recommendations incorporated the recent Miller *et al*. (2013) analysis summarized above and now constitute the best available science.

Second, the SSC's ABC actually is likely to result in an F of 0.1 or less due to the conservative nature of the associated analyses. Using the Miller *et al.* (2013) analysis and only recent data (2009-2012), which analysis suggests will be better correlated with 2014 butterfish biomass, a catch of 9,100 mt of butterfish was predicted to result in a fishing mortality of 0.12 in the Miller *et al.* (2013) analysis. However, the Miller *et al*. (2013) analysis also assumed that the entire Atlantic butterfish stock falls within the bounds of the NEFSC fall trawl survey area, and that the NEFSC fall trawl survey catches 100% of the butterfish in each sample location. Neither of these assumptions is true (butterfish exist outside of the survey area and the trawl survey is not 100% efficient at capturing butterfish), which means that actual butterfish fishing mortalities at 9,100 mt are likely to be less than 0.12.

While information on the efficiency of the NEFSC fall trawl survey is not currently available, it is unlikely to be 100%. Some fish go around, above, or under the bottom trawl net. The possibility of evading the net is especially likely for semi-pelagic species like butterfish. In addition, there is information on butterfish abundance outside of the NEFSC fall trawl survey, which covers about 43,000 square nautical miles (nmi^2). A variety of inshore surveys exist that also regularly catch butterfish including the Northeast Area Monitoring and Assessment Program, the Chesapeake Bay Multispecies Monitoring and Assessment Program, the Connecticut Long Island Trawl Survey, the Delaware Bay trawl survey, Narragansett Bay surveys, the Massachusetts Inshore Bottom Trawl Survey, and the New Hampshire-Maine Inshore Groundfish Survey. Together these surveys cover approximately an additional 9,000 nmi^2 (an additional 21%) of non-overlapping habitat (those surveys have a larger total area but some overlap with the fall trawl survey or each other) where butterfish are known to exist inshore of the NEFSC fall trawl survey. In addition to the inshore areas adjacent to the NEFSC survey, there are butterfish catches in Canadian waters beyond any U.S. surveys, butterfish catches in surveys off the Southeast U.S. not included in any analysis, and possibly butterfish that reside in waters seaward of the deepest waters that the NEFSC fall trawl survey samples. Combined with the fact that no survey catches all of the butterfish in each sample location, it appears very likely that an ABC of 9,100 mt of butterfish would in reality result in a fishing mortality of 0.1 or less.

Alternative 4c – ABC 25% higher than preferred

Table 8. Summary Butterfish Specifications – ABC 25% Higher – 4c

Alternative 4c for Butterfish - 25% Above Preferred (all numbers are in metric tons)	
Specification	Butterfish
Overfishing Limit (OFL)	18,200
Total Acceptable Biological Catch (ABC) = ACL	11,375
Commercial Annual Catch Target (10% less than ACL to account/buffer for management uncertainty)	10,238
Landings or "Domestic Annual Harvest (DAH)"	5,248
Butterfish Cap	3,884

In the table above, while 9,100 mt ABC is the recommendation of the SSC, a value of 11,375 mt is considered to provide a range of alternatives. The 10% deduction from the ABC to determine the ACT accounts for management uncertainty.

The cap would be set at 3,884 mt, the same as with the preferred alternative since recent fishery results suggest that the longfin squid fishery can operate within that cap as long as butterfish discard rates remain relatively low. The additional catch would be used to increase the landings quota to 5,248 mt. There would still be 1,106 mt unallocated in order to cover discards that may occur in other fisheries.

The DAH would be utilized in a 3-Phase system that allows some directed fishing without trip limits initially (for vessels using 3-inch or greater mesh), and then implements a 5,000 pound trip limit for a time, and then implements a 500 pound trip limit as a backstop (or a 600 pound trip limit if alternative 3b is chosen). Incidental permits have a 600 pound trip limit year-round. The amounts available in each phase change as the year progresses such that more quota is shifted to the earlier, less restricted phases as the year progresses since less of a backstop is required as there becomes less time until the beginning of the next year. The allocations for the phases under this alternative are listed in the table below. All other measures besides those contemplated in this action, and described at http://www.nero.noaa.gov/nero/regs/infodocs/MSBInfoSheet.pdf, would remain the same.

Table 9. Butterfish Phases under 4c

Months	Phase 1 Available Landings	Phase 2 Available Landings	Phase 3 Available Landings	Total
Jan/Feb	3,706	463	1,079	5,248
Mar/Apr	3,886	437	925	5,248
May/Jun	4,092	411	745	5,248
Jul/Aug	4,297	386	565	5,248
Sep/Oct	4,503	360	386	5,248
Nov/Dec	4,683	334	231	5,248

Alternative 4d – ABC 25% lower than preferred

Table 10. Summary Butterfish Specifications – ABC 25% Lower 4d

Alternative 4d for Butterfish - Above Status Quo, 25% Below Preferred (all numbers are in metric tons)	
Specification	Butterfish
Overfishing Limit (OFL)	18,200
Total Acceptable Biological Catch (ABC) = ACL	6,825
Commercial Annual Catch Target (10% less than ACL to account/buffer for management uncertainty)	6,143
Landings or "Domestic Annual Harvest (DAH)"	2,400
Butterfish Cap	2,913

In the table above, while 8,400 mt ABC is the recommendation of the SSC, a value of 6,825 mt is considered to provide a range of alternatives. The 10% deduction from the ABC to determine the ACT accounts for management uncertainty.

Landings would be set at 2,400 and the cap would be set at 2,913 mt - both would be reduced 25% from the preferred alternative. This also leaves 830 mt unallocated to cover discards in other fisheries.

The DAH would be utilized in a 3-Phase system that allows some directed fishing without trip limits initially (for vessels using 3-inch or greater mesh), and then implements a 5,000 pound trip limit for a time, and then implements a 500 pound trip limit as a backstop (or a 600 pound trip limit if alternative 3b is chosen). Incidental permits have a 600 pound trip limit year-round. The amounts available in each phase change as the year progresses such that more quota is shifted to the earlier, less restricted phases as the year progresses since less of a backstop is required as there becomes less time until the beginning of the next year. The allocations for the phases under this alternative are listed in the table below. All other measures besides those contemplated in this action, and described at http://www.nero.noaa.gov/nero/regs/infodocs/MSBInfoSheet.pdf, would remain the same.

Table 11. Butterfish Phases under 4d

Months	Phase 1 Available Landings	Phase 2 Available Landings	Phase 3 Available Landings	Total
Jan/Feb	858	463	1,079	2,400
Mar/Apr	1,038	437	925	2,400
May/Jun	1,244	411	745	2,400
Jul/Aug	1,449	386	565	2,400
Sep/Oct	1,655	360	386	2,400
Nov/Dec	1,835	334	231	2,400

6.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND FISHERIES

This section identifies and describes the *valued ecosystem components* (Beanlands and Duinker 1984) that comprise the affected environment and may be affected by the alternatives proposed in this document. The valued ecosystem components are identified and described here as a means of establishing the context for the impact analysis that will be presented in section 7's "Analysis of Impacts." The significance of the various impacts of the proposed alternatives on the valued ecosystem components will also be assessed from a cumulative effects perspective. The valued ecosystem components are:

1. Managed resources (Atlantic mackerel, longfin squid and *Illex* squid and butterfish)
2. Habitat including EFH for the managed resources and non-target species
3. Endangered and other protected resources
4. Non-target species
5. Human communities

Overviews of the managed species and of the physical environment are described first, to establish the context for the valued ecosystem components. Impacts of the alternatives on the physical environment are addressed through analysis of impacts on habitat, as most of the impacted physical environment comprises EFH for various species.

6.1 Description of the Managed Resources

Mackerel

The basic biology of Atlantic mackerel, a semi-pelagic/semi-demersal (may be found near the bottom or higher in the water column) schooling fish species primarily distributed between Labrador (Newfoundland, Canada) and North Carolina, is detailed in the Essential Fish Habitat (EFH) document for the species, located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

The status of Atlantic mackerel is unknown with respect to being overfished or not, and unknown with respect to experiencing overfishing or not. Recent results from the NEFSC Spring Trawl survey (the spring survey catches the most mackerel) are highly variable, and are graphed in the "NEFSC Biological Update" that is created as part of the SSC ABC-setting process. These are available at: http://www.mafmc.org/ssc-meeting-documents/. Mackerel will be in year 2 of three-year multiyear specifications in 2014, and additional information is available in the 2013 specifications EA, available at: http://www.nero.noaa.gov/regs/.

Butterfish

The basic biology of Atlantic butterfish, a semi-pelagic/semi-demersal schooling fish species primarily distributed between Nova Scotia and Florida, is detailed in the EFH document for the species, located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

The status of butterfish is unknown with respect to being overfished or not and "unlikely" with respect to experiencing overfishing or not, based on the 2010 SAW-SARC assessment, available at: http://www.nefsc.noaa.gov/saw/archive.html. Recent results from the NEFSC Fall Trawl survey (the fall survey catches the most butterfish) are highly variable, and are graphed in the "NEFSC Biological Update" that is created as part of the SSC ABC-setting process. These are available at: http://www.mafmc.org/ssc-meeting-documents/. The NEFSC has conducted additional analysis based on recent survey data that suggests the absolute butterfish stock is likely larger than recent assessments have suggested and that overfishing appears unlikely at current or proposed catch levels. That analysis is available at http://www.mafmc.org/s/3-Butterfish_Updates_for_2014_Specs.pdf and was the basis for the SSC's 2014 ABC recommendation.

Longfin Squid

The basic biology of longfin squid, a semi-pelagic/semi-demersal schooling cephalopod species primarily distributed between Georges Bank and Cape Hatteras, NC, is detailed in the EFH document for the species, located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

Based on a new proposed biomass reference point from a 2010 SAW-SARC assessment, the longfin squid stock was not overfished in 2009, but overfishing status was not determined because no overfishing threshold was recommended (though the assessment did describe the stock as "lightly exploited'). The assessment documents are available at: http://www.nefsc.noaa.gov/saw/reports.html. Recent results from the NEFSC Trawl surveys are highly variable, and are graphed in the "NEFSC Biological Update" that is created as part of the SSC ABC-setting process. These are available at: http://www.mafmc.org/ssc-meeting-documents/. Longfin squid will be in year 3 of three-year multiyear specifications in 2014, and additional information is available in the 2012 specifications EA, available at: http://www.nero.noaa.gov/regs/.

Illex Squid

The basic biology of *Illex* squid, a semi-pelagic/semi-demersal schooling cephalopod species distributed between the Florida Straits and Newfoundland, is detailed in the EFH document for the species, located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

The status of *Illex* is unknown with respect to being overfished or not, and unknown with respect to experiencing overfishing or not. Recent results from the NEFSC Trawl surveys are highly variable, and are graphed in the "NEFSC Biological Update" that is created as part of the SSC ABC-setting process. These are available at: http://www.mafmc.org/ssc-meeting-documents/. *Illex* will be in year 3 of three-year multiyear specifications in 2014, and additional information is available in the 2012 specifications EA, available at: http://www.nero.noaa.gov/regs/.

6.2 Physical Environment

Climate, physiographic, and hydrographic differences separate the Atlantic Ocean from Maine to Florida into two distinct areas, the New England-Middle Atlantic Area and the South Atlantic Area, with the natural division occurring at Cape Hatteras, though the division is better thought of as a mixing zone rather than as a definitive boundary. The MSB fisheries are prosecuted in the New England-Middle Atlantic Area. The inshore New England-Middle Atlantic area is fairly uniform physically and is influenced by many large coastal rivers and estuarine areas. The continental shelf (characterized by water less than 650 ft. in depth) extends seaward approximately 120 miles off Cape Cod, narrows gradually to 70 miles off New Jersey, and is 20 miles wide at Cape Hatteras. Surface circulation is generally southwesterly on the continental shelf during all seasons of the year, although this may be interrupted by coastal indrafting and some reversal of flow at the northern and southern extremities of the area. Water temperatures range from less than 33 ^{o}F from the New York Bight north in the winter to over 80 ^{o}F off Cape Hatteras in summer.

Within the New England-Middle Atlantic Area, the principal area within which the MSB fisheries are prosecuted is the Northeast Shelf Ecosystem which includes the area from the Gulf of Maine to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream. A number of distinct subsystems comprise the region. The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with various sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It is characterized by highly productive, well-mixed waters and fast-moving currents. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, NC. Detailed information on the affected physical and biological environments inhabited by the managed resources is available in Stevenson et al. (2006).

Ecosystems Considerations

The Mid-Atlantic Fishery Management Council (Council) has engaged its SSC to help the Council:

-Develop ecosystem level goals, objectives, and policies;

-Incorporate ecosystem structure and function in FMPs to account for ecological sustainability;

-Anticipate and/or respond to shifts in ecological conditions and/or processes; and

-Consider evolving current FMPs into regional ecosystem-based plans.

Developing ecosystem policies will be a multi-year process. In the meantime, this section provides background on the broad ecosystem in which the Atlantic Mackerel, Squid, and Butterfish fisheries generally take place. This section is generally adapted from the "Ecosystem Status Report for the Northeast U.S. Continental Shelf Large Marine Ecosystem" (Ecosystem Assessment Program 2011 - http://www.nefsc.noaa.gov/publications/crd/crd1207/crd1207.pdf). The Council's SSC also takes ecosystem factors into account when setting ABCs.

The Northeast U.S. Continental Shelf Large Marine Ecosystem is a dynamic, highly productive, and intensively studied system providing a broad spectrum of ecosystem goods and services. This region, encompassing the continental shelf area between Cape Hatteras and the Gulf of Maine, spans approximately 250,000 km^2 and supports some of the highest revenue fisheries in the U.S. The system

historically underwent profound changes due to very heavy exploitation by distant-water and domestic fishing fleets. Further, the region is experiencing changes in climate and physical forcing that have contributed to large-scale alteration in ecosystem structure and function. Projections indicate continued future climate change related to both short and medium terms cyclic trends as well as non-cyclic climate change. The main findings of the 2011 Ecosystem Assessment Program update are:

-The Northeast Shelf Large Marine Ecosystem can be divided into four Ecological Production Units, which can in turn provide spatial domains for Ecosystem Based Fisheries Management.

-Atlantic basin scale climate indices, the North Atlantic Oscillation and the Atlantic Multidecadal Oscillation, are at extreme levels, which are reflected in local scale climate changes.

-The physical nature of the Northeast U.S. Continental Shelf Large Marine Ecosystem continues to change, notably there has been a decline in Labrador origin water, which influences salinity and food web processes in the ecosystem, and, there has been an increase in water column stratification, which affects the vertical transport of nutrients.

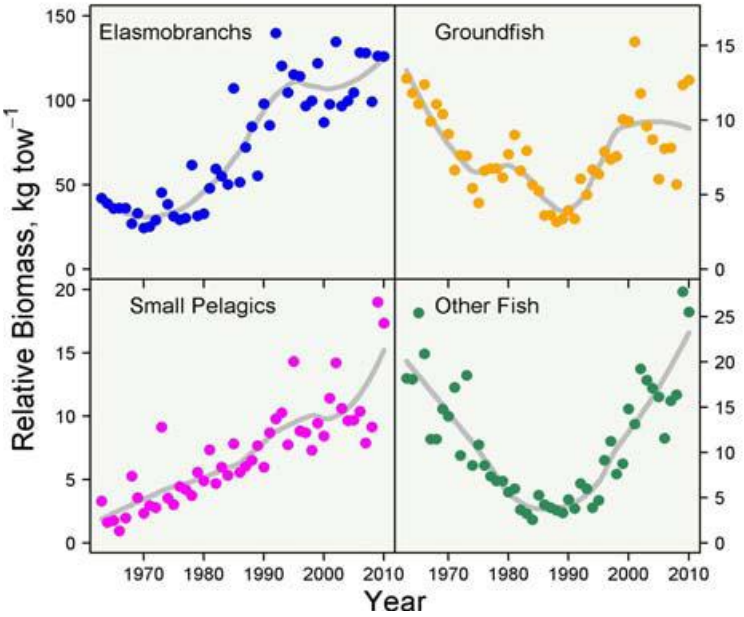
-Recent increases in primary phytoplankton production are not matched by increases in secondary zooplankton production raising the concern that the phytoplankton community structure is shifting to species that fail to effectively enter the food web.

-Many benthic resources have increased in recent years, which can be attributed to both fishery management strategies and environmental effects. The total biomass of fish species remains high.

-Though revenues have remained at high levels in the commercial fishing industry, employment in marine-related employment sectors has declined in recent years.

Since mackerel and the squids at least partially feed on small pelagics or their larvae at some life stage, and all MSB species are preyed upon by a wide variety of finfish at some life stage, mean catches of several fish groups in the NEFSC bottom trawl surveys are provided in the figure below. The 2009 Ecosystem Assessment Program (http://www.nefsc.noaa.gov/publications/crd/crd0911/crd0911.pdf) also noted that consumption of finfish by marine mammals has had a substantially increasing trend.

Figure 2. Mean catch per tow of various species caught in NEFSC bottom trawl surveys



6.3 Habitat, Including Essential Fish Habitat (EFH)

Pursuant to the Magnuson Stevens Act / EFH Provisions (50 CFR Part 600.815 (a)(1)), an FMP must describe EFH by life history stage for each of the managed species in the plan. This information was updated via Amendment 11 to the MSB FMP. EFH for the managed resource is described using fundamental information on habitat requirements by life history stage that is summarized in a series of documents produced by NMFS and available at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/. Matrices of habitat parameters (i.e. temperature, salinity, light, etc.) for eggs/larvae and juveniles/adults were developed and the updated EFH designations (text and maps) use this information and are available at http://www.nero.noaa.gov/nero/regs/com.html in the Amendment 11 EIS (search for Amendment 11 in the July 2011 actions). In general, the EFH for the MSB species is the water column itself, and the species have temperature and prey preferences/needs that drive the suitability of any particular area/depth, thus fishing activity has minimal impacts. Longfin squid also use hard bottom, submerged vegetation, other natural or artificial structure, and sand or mud to attach/anchor eggs, but there are no known preferences for different types of substrates or indications that fishing activity may negatively impact longfin squid egg EFH.

There are other lifestages of federally-managed species that have designated EFH that may be susceptible to adverse impacts from bottom-tending mobile gear as described in the following table (see Stevenson et al 2004):

Table 12. EFH descriptions for species vulnerable to trawl gear

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Bottom Type
American plaice	juvenile	GOM, including estuaries from Passamaquoddy Bay to Saco Bay, ME and from Massachusetts Bay to Cape Cod Bay	45 - 150	Fine grained sediments, sand, or gravel
American plaice	adult	GOM, including estuaries from Passamaquoddy Bay to Saco Bay, ME and from Massachusetts Bay to Cape Cod Bay	45 - 175	Fine grained sediments, sand, or gravel
Atlantic cod	juvenile	GOM, GB, eastern portion of continental shelf off SNE, these estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25 - 75	Cobble or gravel
Atlantic cod	adult	GOM, GB, eastern portion of continental shelf off SNE, these estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10 - 150	Rocks, pebbles, or gravel
Atl halibut	juvenile	GOM and GB	20 - 60	Sand, gravel, or clay
Atl halibut	adult	GOM and GB	100 - 700	Sand, gravel, or clay
Barndoor skate	juvenile/ adult	Eastern GOM, GB, SNE, Mid-Atlantic Bight to Hudson Canyon	l0-750, most < 150	Mud, gravel, and sand
Black sea bass	juvenile	GOM to Cape Hatteras, NC, including estuaries from Buzzards Bay to Long Island Sound, Gardiners Bay, Barnegat Bay to Chesapeake Bay, Tangier/ Pocomoke Sound, and James River	1 - 38	Rough bottom, shellfish/ eelgrass beds, manmade structures, offshore clam beds, and shell patches
Black sea bass	adult	GOM to Cape Hatteras, NC, including Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay, and James River	20 - 50	Structured habitats (natural and manmade), sand and shell substrates preferred
Clearnose skate	juvenile/ adult	GOM, along continental shelf to Cape Hatteras, NC, including the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 – 500, most < 111	Soft bottom and rocky or gravelly bottom
Haddock	juvenile	GB, GOM, and Mid-Atlantic south to Delaware Bay	35 - 100	Pebble and gravel

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Bottom Type
Haddock	adult	GB, eastern side of Nantucket Shoals, and throughout GOM	40 - 150	Broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches
Little skate	juvenile/ adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes estuaries from Buzzards Bay south to mainstem Chesapeake Bay	0-137, most 73 - 91	Sandy or gravelly substrate or mud
Ocean pout	eggs	GOM, GB, SNE, and Mid-Atlantic south to Delaware Bay, including the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay and Cape Cod Bay	<50	Generally sheltered nests in hard bottom in holes or crevices
Ocean pout	juvenile	GOM, GB, SNE, Mid-Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay, and Cape Cod Bay	< 50	Close proximity to hard bottom nesting areas
Ocean pout	adult	GOM, GB, SNE, Mid-Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay, MA Bay, Boston Harbor, and Cape Cod Bay	< 80	Smooth bottom near rocks or algae
Pollock	adult	GOME, GB, SNE, and Mid-Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., MA Bay, Cape Cod Bay, Long Island Sound	15 – 365	Hard bottom habitats including artificial reefs
Red hake	juvenile	GOM, GB, continental shelf off SNE, and Mid-Atlantic south to Cape Hatteras, including the following estuaries: Passamaquoddy Bay to Saco Bay, Great Bay, MA Bay to Cape Cod Bay; Buzzards Bay to CT River, Hudson River, Raritan Bay, and Chesapeake Bay	< 100	Shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOM, GB, continental shelf off SNE, Mid-Atlantic south to Cape Hatteras, these estuaries: Passamaquoddy Bay to Saco Bay, Great Bay, MA Bay to Cape Cod Bay; Buzzards Bay to CT River, Hudson River, Raritan Bay, Delaware Bay, and Chesapeake Bay	10 - 130	In sand and mud, in depressions
Redfish	juvenile	GOM, southern edge of GB	25 - 400	Silt, mud, or hard bottom
Redfish	adult	GOM, southern edge of GB	50 - 350	Silt, mud, or hard bottom
Rosette skate	juvenile/ adult	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33-530, most 74-274	Soft substrate, including sand/mud bottoms
Scup	juvenile/ adult	GOM to Cape Hatteras, NC, including the following estuaries: MA Bay, Cape Cod Bay to Long Island Sound, Gardiners Bay to Delaware inland bays, and Chesapeake Bay	0-38 for juv 2-185 for adult	Demersal waters north of Cape Hatteras and inshore estuaries (various substrate types)
Silver hake	juvenile	GOM, GB, continental shelf off SNE, Mid-Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, ME, MA Bay to Cape Cod Bay	20 – 270	All substrate types
Summer Flounder	juvenile/ adult	GOM to Florida – estuarine and over continental shelf to shelf break	0-250	Demersal/estuarine waters, varied substrates. Mostly inshore in summer and offshore in winter.
Smooth skate	juvenile/ adult	Offshore banks of GOM	31–874, most 110-457	Soft mud (silt and clay), sand, broken shells, gravel and pebbles
Thorny skate	juvenile/ adult	GOM and GB	18-2000, most 111-366	Sand, gravel, broken shell, pebbles, and soft mud
Tilefish	juvenile/ adult	Outer continental shelf and slope from the U.S./Canadian boundary to the Virginia/North Carolina boundary	100 - 300	Burrows in clay (some may be semi-hardened into rock)
White hake	juvenile	GOM, southern edge of GB, SNE to Mid-Atlantic and the following estuaries: Passamaquoddy Bay, ME to Great Bay, NH, Massachusetts Bay to Cape Cod Bay	5 - 225	Seagrass beds, mud, or fine grained sand
Winter flounder	adult	GB, inshore areas of GOM, SNE, Mid- Atlantic south to Delaware Bay and the estuaries from Passamaquoddy Bay, ME to Chincoteague Bay, VA	1 - 100	Mud, sand, and gravel

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Bottom Type
Winter skate	juvenile/ adult	Cape Cod Bay, GB, SNE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, most < 111	Sand and gravel or mud
Witch flounder	juvenile	GOM, outer continental shelf from GB south to Cape Hatteras	50 - 450 to 1500	Fine grained substrate
Witch flounder	adult	GOME, outer continental shelf from GB south to Chesapeake Bay	25 - 300	Fine grained substrate
Yellowtail flounder	adult	GB, GOM, SNE and Mid-Atlantic south to Delaware Bay and these estuaries: Sheepscot River and Casco Bay, ME, MA Bay to Cape Cod Bay	20 - 50	Sand or sand and mud

6.3.1 Fishery Impact Considerations

Any actions implemented in the FMP that affect species with overlapping EFH were assessed in Amendment 9 to the MSB FMP in 2008 (http://www.mafmc.org/fmp/history/smb-hist.htm). Mackerel are primarily caught by mid-water trawls (which should not impact the bottom) but longfin squid, *Illex* squid, and butterfish are primarily caught with bottom trawls (mobile bottom-tending gear) that does contact the bottom. Amendment 9 included an analysis of the adverse impacts of the MSB fisheries on EFH (as required pursuant to section 303(a)(7) of the MSA). In Amendment 9 the Council determined that bottom trawls used in MSB fisheries do have the potential to adversely affect EFH for some federally-managed fisheries in the region and closed portions of two offshore canyons (Lydonia and Oceanographer) to squid trawling. Subsequent closures were implemented in these and two other canyons (Veaches and Norfolk) to protect tilefish EFH and prohibited all bottom trawling activity. Because there have be no significant changes to the manner in which the MSB fisheries are prosecuted, and because none of the alternatives being considered in this document should adversely affect EFH (see section 7.0), no additional alternatives to minimize adverse effects on EFH are considered as part of this management action. The Council is also considering protections for Deep-Sea Corals via Amendment 16 to the MSB FMP.

6.4 ESA Listed Species and MMPA Protected Species

There are numerous species which inhabit the environment within the management unit of this FMP that are afforded protection under the Endangered Species Act (ESA) of 1973 (i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act of 1972 (MMPA). Eighteen species are classified as endangered or threatened under the ESA, while the rest are protected by the provisions of the MMPA. The subset of these species that are known to have interacted with the MSB fisheries is starred in the list below, including several candidate species (species being considered for listing as an endangered or threatened species).

Candidate species receive no substantive or procedural protection under the ESA; however, NMFS recommends considering conservation actions to limit the potential for adverse effects on candidate species. The Protected Resources Division of the NMFS Northeast Regional Office has initiated review of recent stock assessments, bycatch information, and other information for these candidate species which will be incorporated in the status review reports for candidate species

* = Known to have interacted with MSB fisheries

Cetacean Species	**Status**
North Atlantic right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Sperm whale (*Physeter macrocephalus*	Endangered
Minke whale (*Balaenoptera acutorostrata*)	Protected
Beaked whales (*Ziphius and Mesoplodon spp*.)	Protected
*Risso's dolphin (*Grampus griseus*)	Protected
*Pilot whale (*Globicephala spp*.)	Protected
*White-sided dolphin (*Lagenorhynchus acutus*)	Protected
*Common dolphin (*Delphinus delphis*)	Protected
Spotted and striped dolphins (*Stenella spp*.)	Protected
*Bottlenose dolphin (*Tursiops truncatus*)	Protected

Sea Turtles Species	**Status**
*Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered
Hawksbill sea turtle (*Eretmochelys imbricata*)	Endangered
*Loggerhead sea turtle (*Caretta caretta*)	
-Northwest Atlantic DPS	Threatened

Fish Species	**Status**
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon – Gulf of Main DPS(*Salmo salar*)	Endangered
Atlantic sturgeon (*Acipenser oxyrinchus*)	

Chesapeake Bay DPS	Endangered
New York Bight DPS	Endangered
Carolina DPS	Endangered
South Atlantic DPS	Endangered
Gulf of Maine DPS	Threatened
Cusk (*Brosme brosme*)	Candidate

Protected Species Interactions with the Managed Resources – Includes Fishery Classification under Section 118 of Marine Mammal Protection Act

Species	Status
Common dolphin (*Delphinus delphis*)	Protected
White-sided dolphin (*Lagenorhynchus acutus*)	Protected
Pilot whale (*Globicephala spp*.)	Protected
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Loggerhead sea turtle (*Caretta caretta*)	
-Northwest Atlantic DPS	Threatened
Risso's dolphin (*Grampus griseus*)	Protected
Bottlenose dolphin (*Tursiops truncatus*)	Protected

Under section 118 of the MMPA, NMFS must publish and annually update the List of Fisheries (LOF), which places all U.S. commercial fisheries in one of three categories based on the level of incidental serious injury and mortality of marine mammals in each fishery (arranging them according to a two tiered classification system). The categorization of a fishery in the LOF determines whether participants in that fishery may be required to comply with certain provisions of the MMPA, such as registration, Northeast Fishery Observer Program observer coverage, and take reduction plan requirements. The classification criteria consists of a two tiered, stock-specific approach that first addresses the total impact of all fisheries on each marine mammal stock (Tier 1) and then addresses the impact of the individual fisheries on each stock (Tier 2). If the total annual mortality and serious injury of all fisheries that interact with a stock is less than 10% of the Potential Biological Removal (PBR) for the stock then the stock is designated as Tier 1 and all fisheries interacting with this stock would be placed in Category III. Otherwise, these fisheries are subject to categorization under Tier 2. PBR is the product of minimum population size, one-half the maximum productivity rate, and a "recovery" factor (MMPA Sec. 3. 16 U.S.C. 1362; Wade and Angliss 1997). The current (2012) list of fisheries is available at: http://www.nmfs.noaa.gov/pr/interactions/lof/.

Under Tier 2, individual fisheries are subject to the following categorization:

Category I. Annual mortality and serious injury of a stock in a given fishery is greater than or equal to 50% of the PBR level;
Category II. Annual mortality and serious injury of a stock in a given fishery is greater than one percent and less than 50% of the PBR level; or

Category III. Annual mortality and serious injury of a stock in a given fishery is less than one percent of the PBR level.

In Category I, there is documented information indicating a "frequent" incidental mortality and injury

of marine mammals in the fishery. In Category II, there is documented information indicating an "occasional" incidental mortality and injury of marine mammals in the fishery. In Category III, there is information indicating no more than a "remote likelihood" of an incidental taking of a marine mammal in the fishery or, in the absence of information indicating the frequency of incidental taking of marine mammals, other factors such as fishing techniques, gear used, methods used to deter marine mammals, target species, seasons and areas fished, and species and distribution of marine mammals in the area suggest there is no more than a remote likelihood of an incidental take in the fishery. "Remote likelihood" means that annual mortality and serious injury of a stock in a given fishery is less than or equal to 10% of the PBR level or, that it is highly unlikely that any marine mammal will be incidentally taken by a randomly selected vessel in the fishery during a 20-day period or, in the absence of reliable information it is at the discretion of the Assistant Administrator for Fisheries to determine whether the incidental injury or mortality qualifies (or not) for a specific category.

Marine Mammal Stock Assessment Reports:

As required by the Marine Mammal Protection Act (MMPA), NMFS has incorporated earlier public comments into revisions of marine mammal stock assessment reports (SARs). These reports contain information regarding the distribution and abundance of the stock, population growth rates and trends, the stock's Potential Biological Removal level, estimates of annual human-caused mortality and serious injury from all sources, descriptions of the fisheries with which the stock interacts, and the status of the stock. The MMPA requires these assessments to be reviewed at least annually for strategic stocks and stocks for which significant new information is available, and at least once every 3 years for non-strategic stocks. The most recent SARs are available at: http://www.nmfs.noaa.gov/pr/sars/.

NMFS elevated the (mid-water) MSB fishery to Category I in the 2001 LOF but it was reduced to a Category II fishery in 2007 (see discussion below describing the Atlantic Trawl Gear Take Reduction Plan). The reduction in interactions documented between the MSB fisheries and several species/stocks of marine mammals compared to previous years led to the re-classification. No classification changes have occurred since 2007.

6.4.1 Commercial Fisheries Interactions

The following is a description of species of concern because they are protected under MMPA and, as discussed above, have had documented interactions with fishing gears used to harvest species managed under this FMP. Five year take averages are provided as found in Waring *et al* (2012).

Common dolphin (PBR = 529, all fisheries annual take 2006-2010 = 164)

The common dolphin may be one of the most widely distributed species of cetaceans, as it is found worldwide in temperate, tropical, and subtropical seas. They are widespread from Cape Hatteras northeast to Georges Bank (35° to 42° North latitude) in outer continental shelf waters from mid-January to May. Exact total numbers of common dolphins off the US or Canadian Atlantic coast are unknown, although the most recent Stock Assessment Report considers the best abundance estimate for common dolphins to be 67,191 (Coefficient of Variation (CV) =0.29). PBR for the western North Atlantic common dolphin is 529. See Waring *et al*. 2012 (http://www.nmfs.noaa.gov/pr/sars/) for more life history information.

Fishery Interactions - The following fishery interaction information was taken from the latest stock assessment for common dolphin contained in Waring *et al.* (2012) which summarizes incidental mortality of this species. Annual averages are presented below – details on encounters may be reviewed in Waring *et al* (2012).

Illex/Longfin squid/butterfish - These fisheries are included in both the Northeast and Mid-Atlantic bottom trawl fisheries. The 2006-2010 average annual mortality attributed to the northeast bottom trawl was 20 animals (CV=0.13). The 2006-2010 average annual mortality attributed to the Mid-Atlantic bottom trawl was 103 animals (CV=0.13). The portion attributable to the directed *Illex*/longfin squid fisheries is unknown.

Atlantic Mackerel - This fishery is primarily prosecuted with mid-water trawl in the Mid-Atlantic but also with bottom trawl as well. As noted above, the mean estimated annual mortality of common dolphin during the five year period 2006-2010 in the Mid-Atlantic bottom trawl fishery was 103 animals (CV=0.13). For the Mid-Atlantic mid-water trawl fishery the mean estimated annual mortality of common dolphin was 1 (CV=0.7) during the five year period 2006-2010. The portion attributable to the directed Atlantic mackerel fishery is unknown.

Atlantic white-sided dolphin (*Lagenorhynchus acutus*) (PBR = 304, all fisheries annual take 2006-2010 = 212)

Atlantic white-sided dolphins (*Lagenorhynchus acutus)* are found in temperate and sub-polar waters of the North Atlantic, primarily in continental shelf waters to the 100m depth contour. The exact total number of white-sided dolphins (*Lagenorhynchus acutus)* along the eastern US and Canadian Atlantic coast is unknown, although the best available current abundance estimate for white-sided dolphins in the western North Atlantic stock is 48,819 (CV=0.61). PBR for the western North Atlantic stock of white-sided dolphin (*Lagenorhynchus acutus)* is 304. See Waring *et al*. 2012 (http://www.nmfs.noaa.gov/pr/sars/) for more life history information.

Fishery Interactions - The following information was taken from the latest stock assessment for white-sided dolphin (*Lagenorhynchus acutus)* contained in Waring *et al* (2012) which summarized incidental mortality of this species. Annual averages are presented below – details on encounters may be reviewed in Waring *et al* (2012).

Illex/Longfin squid/butterfish - These fisheries are included in both the Northeast and Mid-Atlantic bottom trawl fisheries. The 2006-2010 average annual mortality attributed to the northeast bottom trawl was 142 animals (CV=0.15). The 2006-2010 average annual mortality attributed to the Mid-Atlantic bottom trawl was 20 animals (CV=0.09). The portion attributable to the directed *Illex*/longfin squid fisheries is unknown.

Atlantic Mackerel - This fishery is primarily prosecuted with mid-water trawl in the Mid-Atlantic but also with bottom trawl as well. As noted above, the mean estimated annual mortality during the five year period 2006-2010 in the Mid-Atlantic bottom trawl fishery was 20 animals (CV=0.09). For the Mid-Atlantic mid-water trawl fishery the mean estimated annual mortality of common dolphin was 12 (CV=0.45) during the five year period 2006-2010. The portion attributable to the directed Atlantic mackerel fishery is unknown.

Long-finned (*Globicephala melas*) and short-finned (*Globicephala macrorhynchus*) pilot whales (PBR = 265, all fisheries annual take 2005-2009 = 162) (Note, an updated 2012 assessment document was not available at the time this document was written).

There are two species of pilot whales in the Western Atlantic - the Atlantic (or long-finned) pilot whale, *Globicephala melas*, and the short-finned pilot whale, *G. macrorhynchus*. These species (sp.) are difficult to identify to the species level at sea. Preliminary analysis suggests the following distribution of the two species: sightings south of the mouth of the Chesapeake Bay are likely short-finned pilot whales, as are offshore (near the 4,000m depth contour) sightings from off the mouth of the Chesapeake Bay through off New Jersey. Sightings from the mouth of the Chesapeake Bay to the Southern Edge of Georges Bank along the 100/1,000 m depth contours are likely mixed. Sightings in the Gulf of Maine and east and north of Cape Cod are likely long-finned pilot whales, as are sightings in shelf waters immediately southeast of Nantucket. The minimum population size for short-finned pilot whales is estimated to be 17,190 and the minimum population size for long-finned pilot whales is estimated to be 9,333. PBR for short-finned pilot whales is estimated to be 172 and PBR for long-finned pilot whales is estimated to be 93 (total is 265). See Waring *et al*. 2011 (http://www.nmfs.noaa.gov/pr/sars/) for more life history information.

Fishery Interactions - The following information was taken from the latest stock assessment for pilot whales (*Globicephala* sp.) contained in Waring *et al* (2011) which summarized incidental mortality of this species. Annual averages are presented below – details on encounters may be reviewed in Waring *et al* (2011).

Illex/Longfin squid/butterfish - These fisheries are included in both the Northeast and Mid-Atlantic bottom trawl fisheries. The 2005-2009 average annual mortality attributed to the northeast bottom trawl was 12 animals (CV=0.14). The 2005-2009 average annual mortality attributed to the Mid-Atlantic bottom trawl was 30 animals (CV=0.16). The portion attributable to the directed *Illex*/longfin squid fisheries is unknown.

Atlantic Mackerel - This fishery is primarily prosecuted with mid-water trawl in the Mid-Atlantic but also with bottom trawl as well. As noted above, the mean estimated annual mortality during the five year period 2005-2009 in the Mid-Atlantic bottom trawl fishery was 30 animals (CV=0.16). For the Mid-Atlantic mid-water trawl fishery the mean estimated annual mortality of common dolphin was 2.4 (CV=0.99) during the five year period 2005-2009. The portion attributable to the directed Atlantic mackerel fishery is unknown.

Risso's dolphin (*Grampus griseus*) (PBR = 95, all fisheries annual take 2006-2010 = 17)

Risso's dolphins are distributed worldwide in tropical and temperate seas, and in the Northwest Atlantic occur from Florida to eastern Newfoundland. Off the northeast U.S. coast, Risso's dolphins are distributed along the continental shelf edge from Cape Hatteras northward to Georges Bank during spring, summer, and autumn. In winter, the range is in the Mid-Atlantic Bight and extends outward into oceanic waters. The best population estimate for the western North Atlantic Risso's dolphin is 15,197 (CV=0.55). See Waring *et al*. 2012 (http://www.nmfs.noaa.gov/pr/sars/) for more life history information.

Fishery Interactions - NMFS foreign-fishery observers reported four deaths of Risso's dolphins incidental to squid and mackerel fishing activities in the continental shelf and continental slope waters between March 1977 and December 1991. In the pelagic pair trawl fishery, one mortality was observed in 1992.

Mid- Atlantic Bottom Trawl

Fifteen Risso's dolphins were observed taken in mid-Atlantic bottom trawl fisheries in 2010. This is the first time this species was observed taken in this fishery. The 2010 mortality estimate is currently not available. Until this bycatch estimate can be developed, the 2006-2010 average annual mortality attributed to the mid-Atlantic bottom trawl is calculated as 3 animals (15 animals/5 years). The specific fishery responsible for the 2010 interactions is not yet known.

Mid-Atlantic Mid-water Trawl

One Risso's dolphin mortality was observed in this fishery for the first time in 2008. Until additional information is obtained, the assumed average mortality in this fishery is calculated as 0.2 animals (1 animal/5 years).

Bottlenose dolphin (*Tursiops truncatus*) Offshore Form (not updated in 2012 so information below is from Waring et al 2008). (PBR = 566, all fisheries take is unknown)

There are two morphologically and genetically distinct bottlenose dolphin morphotypes described as the coastal and offshore forms. Both inhabit waters in the western North Atlantic Ocean along the U.S. Atlantic coast. See http://www.nmfs.noaa.gov/pr/sars/ for more life history information.

Fisheries Information

Total estimated mean annual fishery-related mortality for this stock during 2001-2006 is unknown, however mortalities of offshore bottlenose dolphins were observed during this period in the Northeast Sink Gillnet and Mid-Atlantic Gillnet commercial fisheries.

Earlier Interactions

Thirty-two bottlenose dolphin mortalities were observed in the pelagic pair trawl fishery between 1991 and 1995. Estimated annual fishery-related mortality (CV in parentheses) was 13 dolphins in 1991 (0.52), 73 in 1992 (0.49), 85 in 1993 (0.41), 4 in 1994 (0.40) and 17 in 1995 (0.26).

Although there were reports of bottlenose dolphin mortalities in the foreign squid mackerel butterfish fishery during 1977-1988, there were no fishery-related mortalities of bottlenose dolphins reported in the self-reported fisheries information from the mackerel trawl fishery during 1990-1992.

One bottlenose dolphin mortality was documented in the North Atlantic bottom trawl in 1991 and the total estimated mortality in this fishery in 1991 was 91 (CV=0.97). Since 1992 there were no bottlenose dolphin mortalities observed in this fishery.

6.4.2 Atlantic Trawl Gear Take Reduction Plan

In September 2006, the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) convened the Atlantic Trawl Gear Take Reduction Team (ATGTRT) under the Marine Mammal Protection Act (MMPA). The ATGTRT was convened to address incidental mortality and serious injury of long-finned pilot whales (*Globicephala melas*), short-finned pilot whales (*Globicephala macrorhynchus*), common dolphins (*Delphinus delphis*), and Atlantic white-sided dolphins (*Lagenorhynchus acutus*) in several trawl gear fisheries operating in the Atlantic Ocean. These marine mammal species are known to interact with the Mid-Atlantic Mid-Water Trawl, the Mid-Atlantic Bottom Trawl, Northeast Mid-Water Trawl and the Northeast Bottom Trawl fisheries.

The immediate goal of a Take Reduction Plan is to reduce, within six months of implementation, the incidental serious injury or mortality of marine mammals from commercial fishing to levels less than PBR. The long-term goal is to reduce, within five years of its implementation, the incidental serious injury and mortality of marine mammals from commercial fishing operations to insignificant levels approaching a zero serious injury and mortality rate, taking into account the economics of the fishery, the availability of existing technology, and existing state or regional FMPs.

Presently, none of these marine mammal stocks under consideration by the ATGTRT are classified as a strategic stock nor do they currently interact with a Category I fishery. NOAA's General Counsel legal guidance has stated that neither the 11 month timeline for the development of a Take Reduction Plan nor the 5 year goal for reaching the Zero Mortality Rate Goal apply to non-strategic stocks that do not interact with Category I fisheries. The ATGTRT agreed that while a take reduction plan may not be required at this time, efforts should be made to identify and conduct research necessary to identify measures to reduce serious injury and mortality of marine mammals in Atlantic trawl fisheries and, ultimately, to achieve the MMPA's Zero Mortality Rate Goal. This information is captured in the Atlantic Trawl Gear Take Reduction Strategy (ATGTRS).

The ATGTRT recommended that two plans be developed to achieve the overall goal of the Take Reduction Strategy to reduce the incidental take of marine mammals in Atlantic trawl fisheries. These include an Education and Outreach Plan and a Research Plan as part of an overall take reduction strategy. The ATGTRT established two sub-groups to develop the Education and Outreach and Research Plans. The Education and Outreach Plan identifies activities that promote the exchange of information necessary to reduce the bycatch of marine mammals in Atlantic trawl fisheries. The Research Plan identifies information and research needs necessary to improve our understanding of the factors resulting in the bycatch in Atlantic trawl fisheries. The results of the identified research will be used to direct additional research and/or identify measures to reduce the serious injury and mortality of short- and long-finned pilot whales, Atlantic white-sided dolphins, and common dolphins in trawl fisheries to levels approaching the Zero Mortality Rate Goal. The Atlantic Trawl Gear Take Reduction Strategy is available at: http://www.nero.noaa.gov/prot_res/atgtrp/.

6.4.3 Description of Turtle Species with Documented Interactions with the MSB Fisheries

The October 2010 Biological Opinion for the MSB (http://www.nero.noaa.gov/prot_res/section7/NMFS-signedBOs/SMB%20BIOP%202010.pdf) fisheries contains detailed information on sea-turtle interactions. This document updates information on sea turtle interactions with trawl gear in the MSB fisheries. Summary information is provided below and the full document above may be consulted for details.

The primary species likely to be adversely affected by the MSB fishery would be loggerhead sea turtles, as they are the most abundant species occurring in U.S. Atlantic waters. Sea sampling and observer data indicate that fewer interactions occur between fisheries that capture MSB and leatherback, Kemp's ridley, and green sea turtles. The primary area of impact of the directed commercial fishery for MSB on sea turtles is likely bottom otter trawls in waters of the Mid-Atlantic from Virginia through New York, from late spring through fall (peak longfin squid abundance July-October). In New England, interactions with trawl gear may occur in summer through early fall (peak squid abundance August -September), although given the level of effort, the probability of interactions is much lower than in the Mid-Atlantic.

There have been 9 observed sea turtle takes in the MSB fishery during the past 11 years (using top species landed). All sea turtle takes have occurred in bottom otter trawl gear participating in the squid fishery. Loggerhead sea turtles are more likely to interact with MSB trawl gear but green, Kemps ridley and leatherback interaction may also occur. All sea turtles were released alive, except the 2002 take, when a gillnet was hauled up as part of the catch when the loggerhead turtle entangled was fresh dead.

Based on data collected by observers for the reported sea turtle captures in or retention in MSB trawl gear, the NEFSC has estimated loggerhead bycatch in the MSB trawl fishery 2005-2008 to be about 25 animals annually (Warden 2011). NMFS estimates 1 leatherback, 2 green, and 2 Kemp's ridley turtles are taken each year based on the very low encounter rates for these species and/or unidentified turtles (Murray 2008).

On March 16, 2010, the Services announced 12-month findings on petitions to list the North Pacific populations and the Northwest Atlantic populations of the loggerhead sea turtle as DPSs with endangered status and published a proposed rule to designate nine loggerhead DPSs worldwide, seven as endangered (North Pacific Ocean DPS, South Pacific Ocean DPS, Northwest Atlantic Ocean DPS, Northeast Atlantic Ocean DPS, Mediterranean Sea DPS, North Indian Ocean DPS, and Southeast Indo-Pacific Ocean DPS) and two as threatened (Southwest Indian Ocean DPS and South Atlantic Ocean DPS). On March 22, 2011, the timeline for the final determination was extended for six months until September 16, 2011 (76 FR 15932).

A final listing determination was published on September 22, 2011 (76 FR 58867). Unlike the proposed listing, the final listing designates four DPSs (Northwest Atlantic, South Atlantic, Southeast Indo-Pacific, Southwest Indian) as threatened, and five DPSs (Northeast Atlantic, Mediterranean, North Indian, North Pacific, South Pacific) as endangered.

6.4.4 Atlantic sturgeon

In 2012 NOAA's Fisheries Service announced a final decision to list five distinct population segments (DPS) of Atlantic sturgeon under the Endangered Species Act. The Chesapeake Bay, New York Bight, Carolina, and South Atlantic DPSs of Atlantic sturgeon were listed as endangered, while the Gulf of Maine DPS was listed as threatened. Atlantic sturgeon from any of the five DPSs could occur in areas where MSB fisheries operate, and the species has been captured in gear targeting longfin squid (Stein et al. 2004a, ASMFC 2007). Therefore, this Environmental Assessment includes background information on Atlantic sturgeon in this section and considers the anticipated effects of the action on Atlantic sturgeon in Section 7 of this Environmental Assessment.

Atlantic sturgeon is an anadromous species that spawns in relatively low salinity, river environments, but spends most of its life in the marine and estuarine environments from Labrador, Canada to the Saint Johns River, Florida. There are no total population size estimates for any of the 5 Atlantic sturgeon DPSs at this time. However, there are two estimates of spawning adults per year for two river systems (e.g., 863 spawning adults for the Hudson River, and 343 spawning adults per year for the Altamaha River). The Altamaha estimate represent only a fraction of the total population size of this subpopulation as Atlantic sturgeon do not spawn every year. Additionally, neither of these estimates include sub-adults or early life stages. Detailed life history information may be found in the 2007 Atlantic Sturgeon Status Review, available at: http://sero.nmfs.noaa.gov/pr/esa/Sturgeon/Atl%20Sturgeon/atlanticsturgeon2007.pdf.

Atlantic sturgeon are known to be captured in sink gillnet, drift gillnet, and otter trawl gear (Stein et al. 2004a, ASMFC TC 2007). Of these gear types, sink gillnet gear poses the greatest known risk of mortality for by-caught sturgeon (ASMFC TC 2007). Sturgeon deaths are rarely reported in the otter trawl observer dataset (ASMFC TC 2007). However, the level of mortality after release from the gear is unknown. For the years 2006 through 2010, an average of 775 Atlantic sturgeon encounters with small mesh otter trawl gear occurred in all areas (759 in the 600 series of statistical areas).

NOAA Fisheries Northeast Regional Office's Sustainable Fisheries Division reinitiated formal intra-service consultation with the Protected Resources Division on the continued operation of seven fisheries as authorized by NMFS including MSB. Re-initiation of these consultations was necessary as these fisheries may affect five distinct population segments of Atlantic sturgeon that were newly listed as threatened or endangered on February 6, 2012. Comments on a draft biological opinion were due July 19, 2013 and a final biological opinion was not available when this document was created. The draft biological opinion found that the MSB fisheries are not likely to appreciably reduce the likelihood of species survival for any Atlantic sturgeon DPS.

6.5 Other Non-Target Species

Illex

This document does not discuss in detail the non-target interactions in the *Illex* fishery because in 2014 *Illex* will be in year three of three-year multi-year specifications and non-target interactions for the three-year specifications were analyzed in the 2012 specifications (see http://www.nero.noaa.gov/regs/ for the accompanying environmental assessments). No actions are contemplated that affect *Illex* fishing. In general, non-target interactions in the *Illex* fishery are low and include butterfish, hakes, John Dories, herring, spiny dogfish, chub mackerel, and a variety of other species caught in small quantities.

The *Illex* fishery can catch longfin squid at times, and this is the subject of alternative set 2. Fishermen report (and data support) that to remain in compliance with longfin squid regulations, they have to sometimes discard large quantities of longfin squid while *Illex* fishing during longfin squid Trimester 2 closures. See section 5.2, above for additional details.

Butterfish

A list of species taken incidentally and discarded in the butterfish fishery has not been calculated because very limited directed fishing for butterfish has occurred recently due to regulations and market demand. It is also very difficult to identify a recent directed butterfish trip in the observer database and double counting with other fisheries would likely occur due to the recent incidental nature of the fishery. Prior specifications identified red hake, silver hake, spiny dogfish, scup, unclassified skates, fourspot flounder, longfin squid, mackerel, and little skate as primary bycatch and/or discard species in the butterfish fishery. Beginning in 2013 a limited directed fishery for butterfish was re-established and these species could be impacted. However, in previous years when the butterfish fishery operated there was no minimum mesh and attitudes about discarding were different. It is expected that the 3" minimum mesh incorporated as part of the reestablishment of the butterfish fishery will minimize bycatch (further reducing the applicability of previous analyses), and any observer data from trips targeting butterfish will be examined in the future to describe non-target interactions and to determine if additional bycatch minimization measures are needed. For non-target species that are managed under their own FMP, incidental catch/discards are also considered as part of the management of that fishery.

Mackerel

This document does not discuss in detail the non-target interactions in the mackerel fishery because in 2014 mackerel will be in year two of three-year multi-year specifications and non-target interactions for the three-year specifications were analyzed in the 2013 specifications (see http://www.nero.noaa.gov/regs/ for the accompanying environmental assessment). In general, non-target interactions in the mackerel fishery are relatively low. Non-target interactions include spiny dogfish, river herrings (blueback and alewife), silver hake, butterfish, scup, American shad, *Illex* squid, and a variety of other species caught in small quantities. For non-target species that are managed under their own FMP, incidental catch/discards are also considered as part of the management of that fishery. These species will be impacted to some degree by the prosecution of the mackerel fishery.

The primary non-target species of current concern for mackerel, and for which there are relevant management measures proposed in this action, are river herrings and shads, since a cap is proposed to be placed on their catch in the mackerel fishery.

River Herring

In the most recent Commission river herring stock assessment (ASMFC 2012), of the 24 river herring stocks for which sufficient data are available to make a conclusion, 23 were depleted relative to historic levels and one was increasing. The status of 28 additional stocks could not be determined because the time-series of available data was too short. Estimates of coastwide abundance and fishing mortality could not be developed because of the lack of adequate data. The "depleted" determination was used instead of "overfished" because of the many factors that have contributed to the declining abundance of river herring, which include not just directed and incidental fishing, but likely also habitat issues (including dam passage, water quality, and water quantity), predation, and climate change. There are no coastwide reference points.

As part of a recent negative Endangered Species Act listing determination for river herring, NMFS completed an extinction risk analysis (http://www.nero.noaa.gov/prot_res/candidatespeciesprogram/RiverHerringSOC.htm). This analysis investigated trends in river herring relative abundance for each species range-wide as well as for each identified stock complex. This analysis found that "the abundance of alewife range-wide significantly increased over time (mid 1970s-2012), but the increase in blueback herring abundance was not significant (page 7 and Figures 8 and 9 of the referenced document). These range-wide analyses incorporated data from fishery independent surveys with the widest geographic extent, specifically the Northeast Fisheries Science Center spring and fall bottom trawl surveys and Canada's Department of Fisheries and Oceans (DFO) Scotian Shelf survey. Stock-specific analyses incorporated run count data and stock-specific fishery-independent surveys. Stock-specific analyses indicated that the abundance of the Canadian alewife stock complex was significantly increasing, the abundance of the mid-Atlantic blueback herring stock complex was significantly decreasing, and all other analyzed stock complexes were not significantly increasing or decreasing in abundance.

NMFS and the Council are beginning a proactive conservation strategy for river herring. This strategy is described at the river herring species of concern website, http://www.nero.noaa.gov/prot_res/candidatespeciesprogram/RiverHerringSOC.htm, and will bring a variety of management partners and stakeholders together to address river herring threats and plan conservation and data gathering activities.

Shad

The most recent American shad stock assessment report (ASMFC 2007) identified that American shad stocks are highly depressed from historical levels. Of the 24 stocks of American shad for which sufficient information was available, 11 were depleted relative to historic levels, 2 were increasing, and 11 were stable (but still below historic levels). The status of 8 additional stocks could not be determined because the time-series of data was too short or analyses indicated conflicting trends. Taken in total, American shad stocks do not appear to be recovering. The assessment concluded that current restoration actions need to be reviewed and new ones need to be identified and applied. These

include fishing rates, dam passage, stocking, and habitat restoration. There are no coastwide reference points for American shad. There is no stock assessment available for hickory shad.

River Herring and Shad Catches in the Mackerel Fishery

Amendment 14 analyzed catch of river herrings and shads (RH/S) extensively, and a FEIS is available at http://www.nero.noaa.gov/regs/2013/August/12smba14pr.html. The analysis described in Appendix 2 of Amendment 14's EIS found that Mid-Atlantic mid-water trawl fishing in Quarter 1, which is largely but not completely mackerel fishing, accounted for about 35% of total ocean river herring catch and about 12% of total ocean shad catch from 2005-2010 (about 160.6 metric tons of river herring and 7.6 tons of shad). While it is not clear what impact that level of catch is having on RH/S stocks, these average annual amounts translate to close to 2 million fish (mostly river herring) if a five fish per pound conversion is used (the offshore fishery is likely to encounter juveniles).

Longfin Squid

While the overall specifications for longfin squid are not considered in this action (in 2014 they will be in year three of three-year multiyear specifications), since some management measure changes are being considered and because the butterfish specifications can affect the amount of longfin squid effort, non-target interactions in the longfin squid fishery are described below. Non-target interactions in the longfin squid fishery are also relatively high compared to the other MSB fisheries.

Various species are caught incidentally by the longfin squid fishery and will be impacted to some degree by the prosecution of the fishery. For non-target species that are managed under their own FMP, incidental catch/discards are also considered as part of the management of that fishery.

The primary database used to assess discarding is the NMFS Observer Program database, which includes data from trips that had trained observers onboard to document discards. One critical aspect of using this database to describe discards is to correctly define the trips that constitute a given directed fishery. Presumably some criteria of what captains initially intend to target, how they may adjust targeting over the course of a trip, and what they actually catch would be ideal. Thus to begin this process, staff first reviewed 2010-2012 trips in the dealer weighout database to see if a certain trip definition could account for most longfin squid landed. Since fisheries evolve over time, and the implementation of the butterfish cap (began in 2011) has likely changed behavior, a relatively recent, three-year time period was examined.

The result of this review resulted in the following definition for longfin squid trips using landings: All trips that had at least 50% longfin squid by weight and all trips that had at least 10,000 pounds of longfin squid regardless of the ratio to other species. This definition results in capturing 89.9% of all longfin squid landings in the dealer weighout database 2010-2012. This definition was applied to the observer database to examine discards in the longfin squid fishery. The resulting set of trips in the observer database included 135 on average for each year 2010-2012. These trips made 4618 hauls of which 92% were observed. Hauls may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, haul slipped (dumped) in the water, etc. While this definition does not match the regulatory definition that is used in the butterfish cap, compared to that definition (more than 2,500 pounds of squid), it captures 6% more of the total longfin squid landings by bringing in smaller longfin squid trips that are mostly longfin squid

The observed longfin squid caught on these trips accounted for approximately 7.6% of the total longfin squid caught (this is the overall coverage rate based on weight). While a very rough estimate, especially given the low observer coverage in small mesh fisheries and non-accounting for spatial and temporal trends, one can use the information in the table immediately following and the fact that about 9,674 MT of longfin squid were caught annually 2010-2012 to generally and roughly estimate annual incidental catch for the species in the table. This is the last column in the table and while this information is provided, readers are strongly cautioned that while this is a reasonable approach for a quick, rough, and relative estimate given the available data, it is highly imprecise and does not follow the protocol used for official discard estimates. Note also that even the estimates that can be calculated would only really be valid for the 89.9% of landings captured by the chosen directed trip definition. It is even more difficult to assess the other 11% because to some degree the longfin squid is being caught incidental to other fisheries in those cases. Nonetheless, the longfin squid-to-other-species ratios were scaled up to the 100% of longfin squid catch to keep calculations relatively simple. Compared to the analysis in last year's specifications, changes in results arise from updates to previous year's observer data, using 2010-2012 observer data versus 2009-2011 data, and the different amount of squid landed over 2010-2012 versus 2009-2011.

Table 13. Primary Incidental Catch and Discards in the Longfin Squid Fishery 2010-2012.

NE Fisheries Science Center Common Name	Pounds Observed Caught	Pounds Observed Discarded	Of all discards observed, percent that comes from given species	Percent of given species that was discarded	For every metric ton of Loligo caught, pounds of given species caught.	D:K Ratio (species discarded to longfin kept)	Rough Annual Catch (pounds) based on 3-year (2010-2012) average of longfin catch (9,674 mt)
SQUID (longfin)	4,840,820	80,356	3%	2%	2,205	0.02	21,327,300
BUTTERFISH	559,787	522,389	20%	93%	255	0.11	2,466,264
SQUID (ILLEX)	554,774	236,034	9%	43%	253	0.05	2,444,178
DOGFISH SPINY	378,347	373,545	14%	99%	172	0.08	1,666,889
HAKE, SILVER	374,685	251,199	10%	67%	171	0.05	1,650,757
HAKE, SPOTTED	269,969	265,052	10%	98%	123	0.06	1,189,407
SCUP	209,686	138,949	5%	66%	95	0.03	923,818
SKATE, LITTLE	114,273	112,427	4%	98%	52	0.02	503,455
FLOUNDER, SUMMER	74,201	32,965	1%	44%	34	0.01	326,911
CRAB, LADY	65,296	65,296	2%	100%	30	0.01	287,675
BLUEFISH	61,127	16,338	1%	27%	28	0.00	269,307
DOGFISH SMOOTH	52,458	38,612	1%	74%	24	0.01	231,114
HERRING, ATLANTIC	52,193	8,518	0%	16%	24	0.00	229,946
HAKE, RED	51,865	49,642	2%	96%	24	0.01	228,501
DORY, BUCKLER (JOHN)	46,322	19,426	1%	42%	21	0.00	204,081
FLOUNDER, FOURSPOT	40,707	40,707	2%	100%	19	0.01	179,341
SEA ROBIN, NORTHERN	36,858	36,763	1%	100%	17	0.01	162,386
SKATE, BIG	31,672	30,118	1%	95%	14	0.01	139,539
SCALLOP, SEA	28,306	25,263	1%	89%	13	0.01	124,707
SEA BASS, BLACK	25,778	15,552	1%	60%	12	0.00	113,569
ANGLER	25,612	11,621	0%	45%	12	0.00	112,838
BASS, STRIPED	25,264	24,741	1%	98%	12	0.01	111,306
SEA WEEDS	23,433	23,433	1%	100%	11	0.00	103,241
FLOUNDER, WINTER	18,653	18,315	1%	98%	8	0.00	82,181
SEA ROBIN, STRIPED	14,690	14,421	1%	98%	7	0.00	64,720
LOBSTER	13,586	10,219	0%	75%	6	0.00	59,856
SHAD, AMERICAN	13,325	12,083	0%	91%	6	0.00	58,705
MACKEREL, ATLANTIC	13,192	5,716	0%	43%	6	0.00	58,119
SKATE, ROSETTTE	11,010	11,010	0%	100%	5	0.00	48,507
HADDOCK	10,197	10,197	0%	100%	5	0.00	44,924
SQUID, NK	8,973	1,418	0%	16%	4	0.00	39,533
HERRING (NK)	8,474	6,762	0%	80%	4	0.00	37,333
HAKE, NK	8,030	7,160	0%	89%	4	0.00	35,378
WINDOWPANE	7,730	7,653	0%	99%	4	0.00	34,058
SKATE, CLEARNOSE	7,202	7,104	0%	99%	3	0.00	31,731
DOGFISH CHAIN	6,225	6,225	0%	100%	3	0.00	27,426
TAUTOG	6,212	5,995	0%	96%	3	0.00	27,370
RAY, BULLNOSE	6,207	6,207	0%	100%	3	0.00	27,344
SKATE, BARNDOOR	6,067	6,067	0%	100%	3	0.00	26,731
CRAB, JONAH	5,909	5,637	0%	95%	3	0.00	26,035
SKATE, NK	5,464	5,464	0%	100%	2	0.00	24,073
ALEWIFE	5,014	4,132	0%	82%	2	0.00	22,091
FISH, NK	4,661	4,641	0%	100%	2	0.00	20,533
HERRING, BLUE BACK	4,628	4,628	0%	100%	2	0.00	20,390

6.6 Human Communities and Economic Environment

6.6.1 Fishery Descriptions

This section describes the socio-economic importance of the mackerel, squid and butterfish fisheries. Recent Amendments to the MSB FMP contain additional information, especially demographic information on ports that land MSB species. See Amendments 11 and 14 at http://www.mafmc.org/fmp/history/smb-hist.htm for more information or visit NMFS' community profiles page at: http://www.nefsc.noaa.gov/read/socialsci/community_profiles/.

For each species with alternatives in this document, Section 6.6 describes the following: history of landings, prices and total revenues since 1982, specification performance for the last 10 years, 2012 data for permitted and active vessels by state, 1997-2012 numbers of permits, 2012 vessel dependence on each managed species as a proportion of total ex-vessel sales, 2010-2012 landings by state, 2010-2012 landings by month, 2010-2012 landings by gear, 2010-2012 landings in key ports, 2010-2012 numbers of active dealers, and 2010-2012 vessel trip report catches by key statistical area. There is also a market overview section for mackerel per the FMP as well as sections for recreational mackerel and longfin squid catch (butterfish are not caught in substantial amounts by recreational fishermen). If less than either 3 vessels or 3 dealers were active for a given species in a given port, or if there is other concern about data confidentiality, some information may be withheld or limited in order to maintain the confidentiality of proprietary business data of fishery participants.

The Council employed a new procedure for gathering information from its Squid-Mackerel-Butterfish Advisory Panel during the 2012 specifications setting process, which it continued for 2014 specifications. The MSB Advisory Panel created a "Fishery Performance Report" for each species based on the advisors' personal and professional experiences as well as reactions to an "informational document" for each species created by Council staff. The Informational Documents and Fishery Performance Reports may be found here http://www.mafmc.org/ssc-meeting-documents/. These documents, while not NMFS or peer-reviewed, and also containing some preliminary information, were constructed using the same basic analytical techniques as this document and may be of interest to readers looking for additional descriptive fishery information.

6.6.2 Atlantic mackerel (mackerel)

Historical Commercial Fishery – History of Landings

The modern northwest mackerel fishery began with the arrival of the European distant-water fleets in the early 1960's. Total international commercial landings (Northwest Atlantic Fisheries Organization Subareas 2-6,) peaked at 437,000 mt in 1973 and then declined sharply to 77,000 by 1977 (Overholtz 1989). The MSA established control of the portion of the mackerel fishery occurring in US waters (Northwest Atlantic Fisheries Organization Subareas 5-6) under the auspices of the Council. Reported foreign landings in US waters declined from an unregulated level of 385,000 mt in 1972 to less than 400 mt from 1978-1980 under the MSA (the foreign mackerel fishery was restricted by NOAA Foreign Fishing regulations to certain areas or "windows." Under the MSB FMP foreign mackerel catches were permitted to increase gradually to 15,000 mt in 1984 and then to a peak of almost 43,000 mt in 1988 before being phased out again.

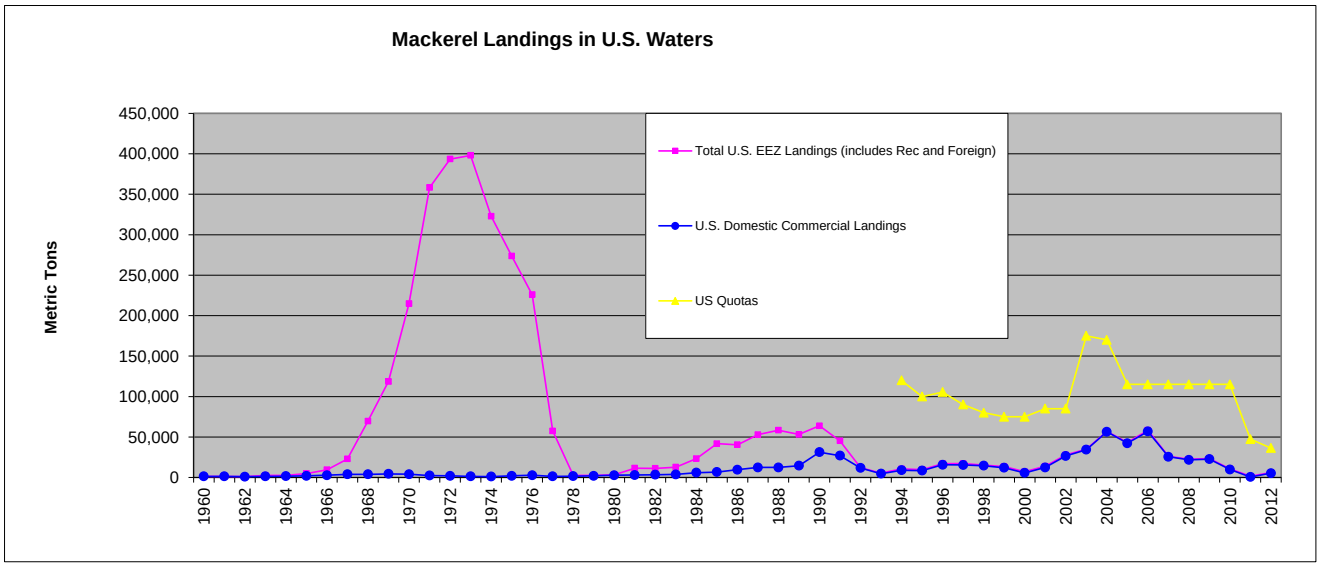


Figure 3. Historical Atl. Mackerel Landings in the U.S. EEZ.

US commercial landings of mackerel increased steadily from roughly 3000 mt in the early 1980s to greater than 31,000 mt by 1990. US mackerel landings declined to relatively low levels 1992-2000 before increasing in the early 2000's. The most recent years have seen a significant drop-off in harvest. The mackerel fishery usually catches 95% of its mackerel by May 1 so while incomplete, available 2013 data suggests that around 3,500-4,000 mt will be landed in 2013.

Nominally ex-vessel price has generally varied between about $200-$400 per mt but when inflation is taken into account there was erosion in the ex-vessel per-pound value of mackerel from 1982-2010. 2011 and 2012 prices increased substantially (near 700$/mt), which is likely at least partially related to the low levels of mackerel landed. Total ex-vessel value tracks both price and the quantity of fish landed (see Fishery Information Document at http://www.mafmc.org/ssc-meetings/2013/april-may for details). 2012 landings totaled 5,336 mt and generated $3.9 million in ex-vessel revenues.

Fishery Performance

Weekly dealer data triggers in-season management actions that institute relatively low trip limits when 90% of the commercial DAH is landed. The table below lists the performance of the mackerel fishery (commercial and recreational together) compared to the effective quota for the last 10 years. There have been no quota overages over this period, primarily because the fisheries have not approached the quotas. Beginning in 2012 any ABC overages must be repaid pound for pound. Discard information is not available to 2012, but it does not appear that mackerel would have approached anywhere near its ABC since discards and recreational catch are usually quite low according to the most recent assessment (TRAC 2012). The 2013 ABC was 43,781 mt, which is also the ABC for 2014.

Table 14. Mackerel Quota Performance. (mt)

Year	Harvest (mt) (Commercial and Recreational)	Quota (mt) (Rec+Com)	Percent of Quota Landed
2003	35,068	175,000	20%
2004	56,912	170,000	33%
2005	43,302	115,000	38%
2006	58,371	115,000	51%
2007	26,130	115,000	23%
2008	22,517	115,000	20%
2009	23,238	115,000	20%
2010	10,649	115,000	9%
2011	1,463	47,395	3%
2012	6,019	36,264	17%

Source: Unpublished NMFS dealer reports and MRIP data

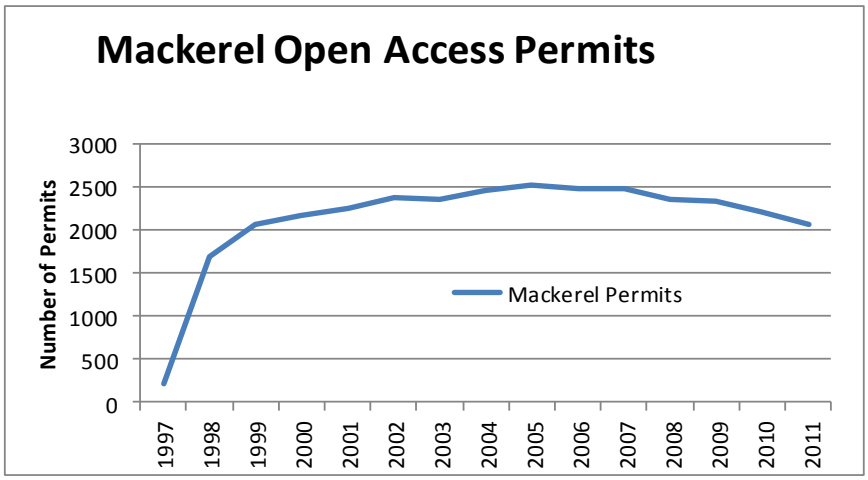
Participation in the fishery was low in 2012 related to the low availability of mackerel. The tables and figures below and on the following pages describe vessel participation, vessel dependency, distribution of landings by state/month/gear/port, dealer participation, and the general at-sea location of recent mackerel landings/catches.

Table 15. 2012 Data for Permitted and Active Vessels by State

Principal Port State	1,000,000 or more pounds	100,000-1,000,000 pounds	50,000-100,000 pounds	10,000-50,000 pounds
MA	.	3	.	3
ME	1	.	.	1
NH	.	2	.	.
NJ	.	4	.	.
NY	.	.	1	1
RI	2	.	.	3
VA	.	.	.	1

Source: Unpublished NMFS dealer reports and permit data.

Figure 4. Mackerel Permits Per Year



Source: Unpublished NMFS permit data.

The mackerel fishery fully became a limited access fishery in 2013. The current numbers of permits are 31 Tier 1 permits, 26 Tier 2 permits, and 89 Tier 3 permits. There are no trip limits for Tier 1, Tier 2 has a 135,000 pound trip limit and Tier 3 has a 100,000 pound trip limit. Tier 3's trip limit is reduced to 20,000 pounds if it catches 7% of the commercial quota.

Table 16. 2012 Vessel Dependence on Mackerel (revenue-based)

Dependence on Mackerel	Number of Vessels in Each Dependency Category
1%-5%	21
5%-25%	11
25%-50%	2
More than 50%	2

Source: Unpublished NMFS dealer reports – not at state level due to data confidentiality issues

Table 17. Recent Landings by State (mt)

Source: Unpublished NMFS dealer reports

YEAR	CT	MA	MD	ME	NA	NC	NH	NJ	NY	RI
2010	17	5,514	0	161	9	21	0	2,128	50	1,976
2011	17	234	0	90	5	3	0	48	60	73
2012	8	1,874	0	19	1	1	0	915	25	2,493

Table 18. Recent Landings by Month (mt)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	5,633	2,654	1,187	160	102	57	10	4	5	54	2	10
2011	22	91	131	113	35	13	56	1	14	4	18	33
2012	668	3,576	948	20	49	4	5	1	36	18	5	5

Source: Unpublished NMFS dealer reports

Table 19. Recent Landings by Gear (mt)

YEAR	Gill Nets	Bottom Trawl	Single Mid-Water Trawl	Pair Mid-Water Trawl	Trap/Pots/Pound Nets/Weir	Other/ Unknown
2010	37	2,763	1,992	4,149	33	903
2011	27	327	69	72	5	30
2012	4	3,063	576	1,488	24	181

Source: Unpublished NMFS dealer reports

Because of data confidentiality issues, details for port revenues from mackerel cannot be provided. Ports that had at least $100,000 in ex-vessel revenues from mackerel over 2010-2012 (combined) included (from more mackerel dollars to less): North Kingstown, RI; New Bedford, MA; Gloucester, MA; Cape May, NJ; Fall River, MA; Point Judith, RI; and Montauk, NY. (*Source: Unpublished NMFS dealer reports.)*

Table 20. Recent Numbers of Active Dealers

	Number of dealers buying at least $10,000 Mackerel	Number of dealers buying at least $100,000 Mackerel
2010	13	5
2011	13	0
2012	5	5

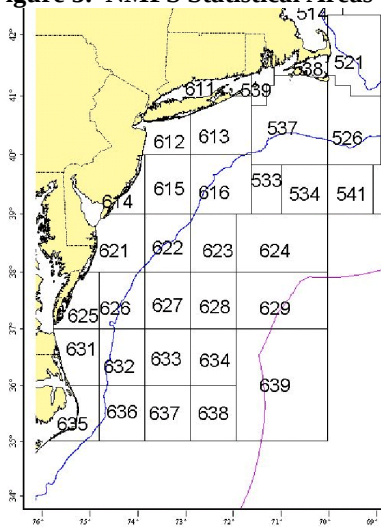
Source: Unpublished NMFS dealer reports

Table 21. Kept Catch in Statistical areas with at least 1,000 mt of mackerel caught in at least one recent year

YEAR	_612	_616	_622	_621
2010	5759.72	383.46	1260.19	1130.74
2011	3.64	99.85	17.95	59.25
2012	2392.64	1526.66	2.81	.

Source: Unpublished NMFS vessel trip reports

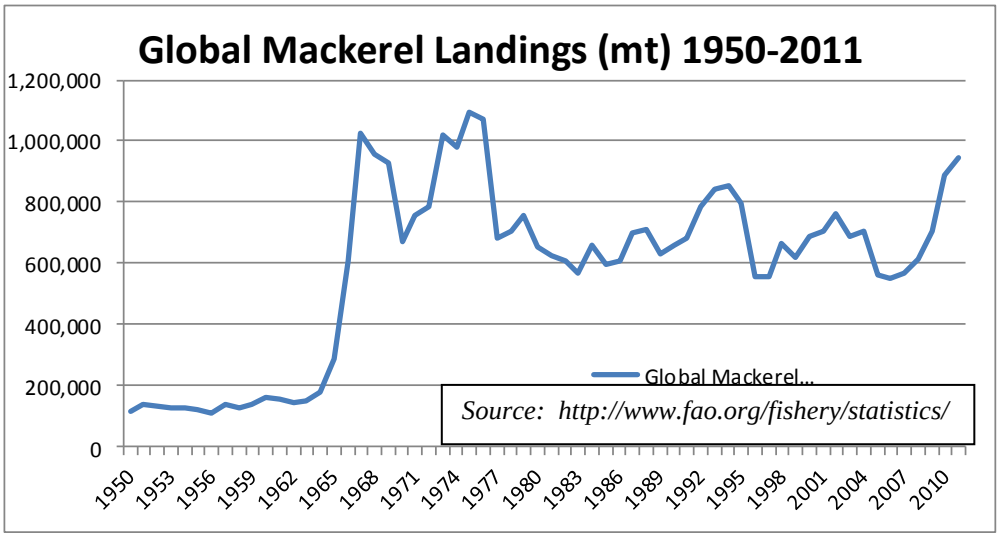
Figure 5. NMFS Statistical Areas



Current Market Overview for Mackerel and World Production (Required by FMP)

US mackerel (western Atlantic) are a substitute for European mackerel (eastern Atlantic), which are caught in much larger quantities. There are ongoing political battles in Europe over mackerel allocations that have recently led to European mackerel losing some Marine Stewardship Council certifications. It is unclear how demand for US mackerel may be impacted by these still unfolding events, but the MSB advisory panel has indicated that in general the demand for mackerel is high if the product is of high quality.

Figure 6. World production of Mackerel, 1950-2011.



Recreational Fishery

Mackerel can be seasonally important to the recreational fisheries of the Mid-Atlantic and New England regions. They may be available to recreational anglers in the Mid-Atlantic primarily during the winter and spring, depending on annual conditions. Mackerel are caught in New England in the summer and fall and are often targeted for purposes of collecting live bait, especially for large striped bass. 2002-2012 recreational landings of mackerel, as estimated from the Marine Recreational Information Program ("MRIP"), are given in the table below. Most mackerel are caught in the private/rental mode but some are caught in the party/charter and shore modes as well. Approximately 10% of all mackerel caught (by number) are released. Compared to other recreationally-important species, estimates for mackerel recreational harvest have low precisions due to low encounter rates. Earlier years (1980s-1991) had higher catches (consistently in the 1,000-4,000 mt range) but most recent years have been below 1,000 mt.

Table 22. Recreational Harvest (rounded to nearest mt) of Mackerel, 2002-2012.

Year	Harvest (MT)
2002	1,294
2003	770
2004	473
2005	1,032
2006	1,511
2007	584
2008	783
2009	603
2010	759
2011	932
2012	683

Source: Personal communication from NMFS, Fisheries Statistics Division.

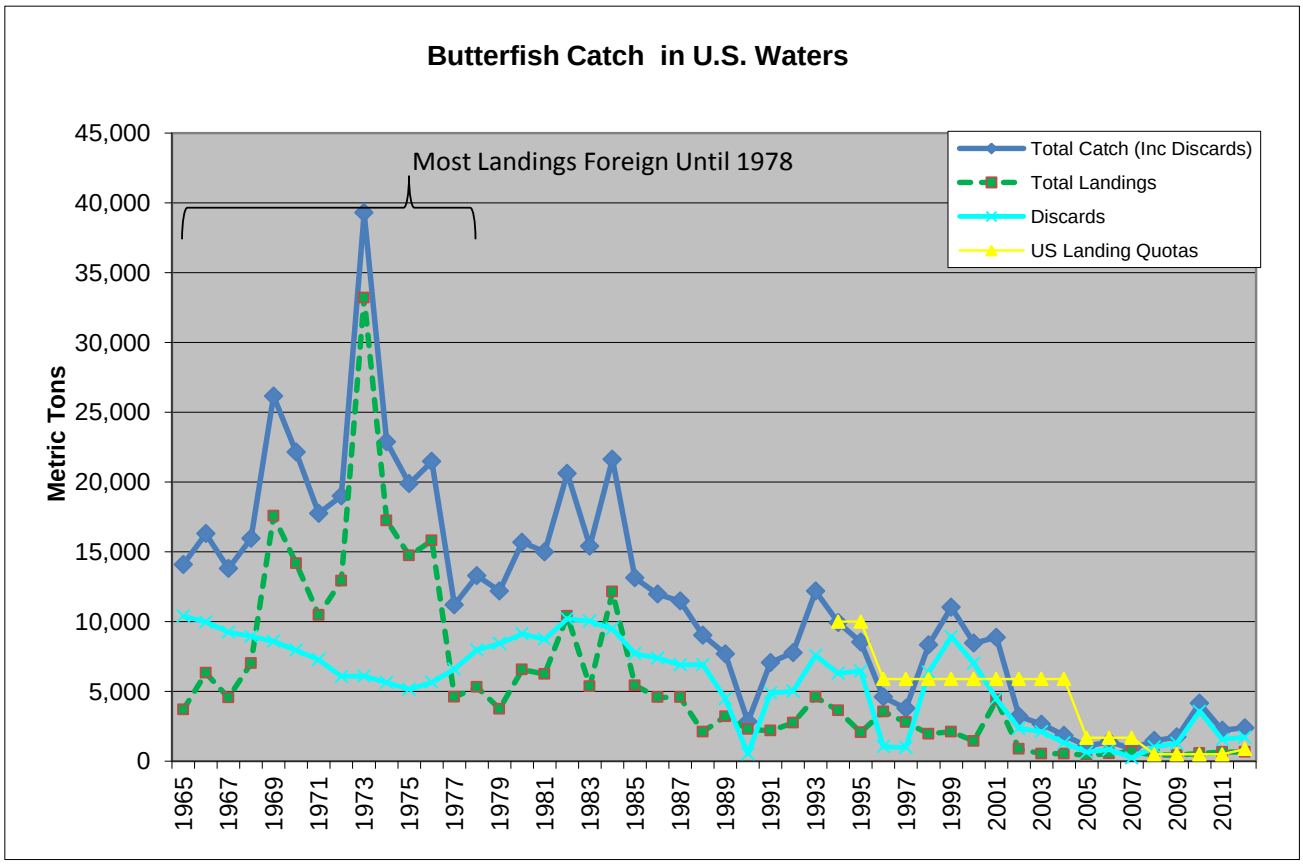
6.6.3 Atlantic butterfish

Historical Commercial Fishery

Atlantic butterfish were landed exclusively by US fishermen from the late 1800's (when formal record keeping began) until 1962 (Murawski and Waring 1979). Reported landings averaged about 3,000 mt from 1920-1962 (Waring 1975). Beginning in 1963, vessels from Japan, Poland and the Union of Soviet Socialist Republics began to exploit butterfish along the edge of the continental shelf during the late-autumn through early spring. Reported foreign catches of butterfish increased from 750 mt in 1965 to 15,000 mt in 1969, and then to about 32,000 mt in 1973. With the advent of extended jurisdiction in US waters, reported foreign catches declined sharply from 14,000 mt in 1976 to 2,000 mt in 1978. Foreign landings were completely phased out by 1987.

During the period 1965-1976, US Atlantic butterfish landings averaged 2,051 mt. From 1977-1987, average US landings doubled to 5,252 mt, with a historical peak of slightly less than 12,000 mt landed in 1984. Since then US landings have declined sharply. Low abundance and reductions in Japanese demand for butterfish probably had a negative effect on butterfish landings in the 1990s-early 2000s but regulations kept butterfish catches low from 2005-2012. Quotas were increased somewhat in 2012 and more so in 2013. The results of 2013 fishing were not available when this document was created.

Figure 7. Historical Butterfish Landings in the U.S. EEZ



Price (nominal) has increased fitfully since 1982 to about $1600/mt in 2012, but taking inflation into account erodes most of that price increase (see Fishery Information Document at http://www.mafmc.org/ssc-meetings/2013/april-may for details). 2012 landings totaled 671 mt and generated $1.1 million in ex-vessel revenues.

Fishery Performance

The principle measure used to manage butterfish landings is monitoring via dealer weighout data that is submitted weekly. The dealer data triggers in-season management actions that institute lower trip limits once various thresholds are crossed, as described in the alternatives for butterfish. The table below lists the performance of the butterfish fishery compared to the effective quota for the last 10 years. There were quota overages in 2010 and 2011. The causes of these are likely the increased butterfish abundance in recent years leading to early closures, as well as incomplete controls on state-permitted vessels. The long time period of incidental post-closure landings has resulted in the fishery ending up over its quota (the new closure system implemented in 2013 should correct this problem). There were ABC overages in 2009-2011 and ABC overages from 2012 on must be repaid. Additional buffering implemented in 2012 should avoid future ABC overages at current ABC levels, but if ABCs are lower in the future care will need to be exercised in order to avoid ABC overages.

Table 23. Butterfish Quota Performance (mt)

Year	Harvest (only commercial)	Quota	Percent of Quota Landed	ABC	Discards	Total Catch	Percent of ABC Caught
2003	536	5,900	9%		2,114	2,649	
2004	537	5,900	9%		1,320	1,857	
2005	428	1,681	25%		648	1,076	
2006	554	1,681	33%		839	1,393	
2007	678	1,681	40%		241	919	
2008	451	500	90%		1,029	1,480	
2009	435	500	87%	1,500	1,298	1,733	116%
2010	576	500	115%	1,500	3,576	4,152	277%
2011	664	500	133%	1,811	1,555	2,219	123%
2012	627	872	72%	4,200	1,726	2,353	56%
2009 was the first year that the SSC provided an ABC recommendation. 2011 was the first year of the butterfish cap, which directly controls most discards. Any ABC overages from 2012 on must be repaid pound for pound.							

Source: Unpublished NMFS dealer reports

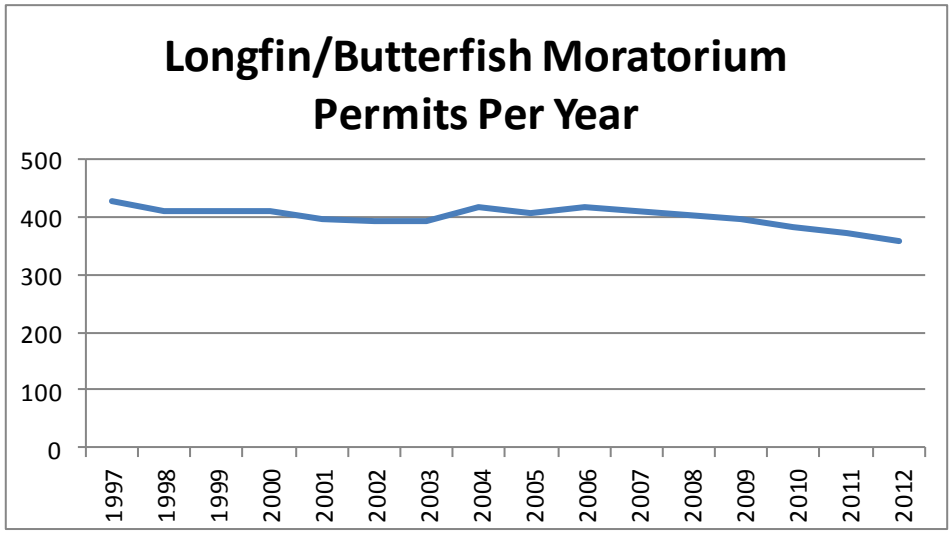
The tables and figures on the following pages describe vessel participation, vessel dependency, distribution of landings by state/month/gear/port, dealer participation, and the general at-sea location of most recent catches.

Table 24. 2012 Data (most recent) for Permitted and Active Vessels by State

State of Principal Port	200,000 or more pounds	50,000-200,000 pounds	10,000-50,000 pounds	1,000-10,000 pounds
CT		.	4	2
MA		.	1	7
NC		.	.	2
NH		.	.	3
NJ		.	1	14
NY		.	14	25
RI		1	18	32
VA		.	.	1

Source: Unpublished NMFS dealer reports and permit data.

Figure 8. Longfin/Butterfish Moratorium Permits Per Year (Combination permit)



Source: Unpublished NMFS permit data.

Table 25. 2012 Vessel Dependence on Butterfish (revenue-based)

Dependence on Butterfish	Number of Vessels in Each Dependency Category
1%-5%	93
5%-25%	15
25%-50%	2
More than 50%	0

Source: Unpublished NMFS dealer reports. (Not at State Level to Avoid Confidentiality Issues)

Table 26. Recent Landings by State (mt)

YEAR	CT	DE	MA	MD	ME	NA	NH	NJ	NY	RI
2010	31	0	79	1	0	5	2	20	184	254
2011	48	0	64	1	0	4	4	29	235	278
2012	82	0	80	3	0	14	2	34	207	249

Source: Unpublished NMFS dealer reports

Table 27. Recent Landings by Month (mt)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	32	17	24	47	82	89	61	71	43	56	37	18
2011	54	40	55	63	97	100	31	25	60	54	47	38
2012	28	46	73	48	72	61	60	59	54	67	67	39

Source: Unpublished NMFS dealer reports

Table 28. Recent Landings by Gear (mt)

YEAR	Bottom Trawl	Dredge	Trap/Pots/Pound/Weir	Other/Unknown
2010	407	28	20	119
2011	451	27	12	174
2012	484	20	13	153

Source: Unpublished NMFS dealer reports

Table 29. Recent Ex-Vessel Revenues by Port for All Ports with at least $50,000 ex-vessel sales totaled over last three years.

YEAR	POINT JUDITH, RI	MONTAUK, NY	NEW BEDFORD, MA	STONINGTON, CT	HAMPTON BAYS, NY	NEWPORT, RI	AMAGANSETT, NY	LITTLE COMPTON, RI	NORTH KINGSTOWN, RI	Belford, NJ	New London, CT
2010	$256,681	$204,895	$ 73,271	$ 28,054	$ 34,693	$ 54,808	$ 22,958	$ 38,253	$ 4,438	CI	CI
2011	$373,268	$281,011	$ 58,929	$ 52,168	$ 47,095	$ 52,997	$ 49,144	$ 21,525	$ 31,224	CI	CI
2012	$301,552	$225,486	$ 75,411	$ 79,928	$ 59,532	$ 32,513	$ 35,268	$ 36,136	$ 27,466	CI	CI

Source: Unpublished NMFS dealer reports. CI = Confidential Data

Table 30. Recent Numbers of Active Dealers

	Number of dealers selling at least $10,000 Butterfish	Number of dealers selling at least $25,000 Butterfish
2010	18	1
2011	21	2
2012	17	2

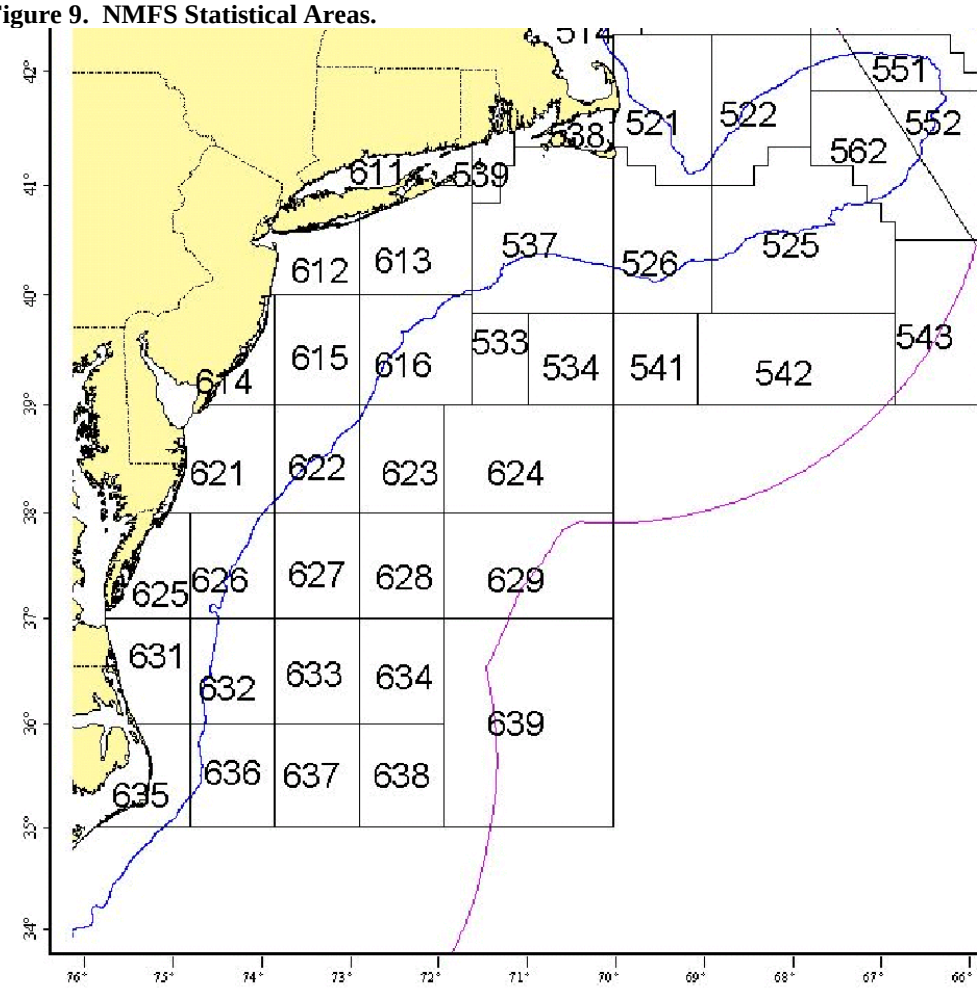
Source: Unpublished NMFS dealer reports

Table 31. Recent Kept Catch in Statistical Areas with substantial recent catch

YEAR	_537	_611	_539	_616	_613	_525	_522	_562	_612
2010	127.6	54.14	65.42	36.86	29.09	25.69	20.46	27.61	12.3173
2011	105.3	81.37	61.69	72.45	31.19	31.03	10.34	8.884	8.5012
2012	102.9	57.98	64.37	36.93	44.31	31.18	18.87	12.58	23.4897

Source: Unpublished NMFS vessel trip reports

Figure 9. NMFS Statistical Areas.



6.6.4 Longfin Squid

Historical Commercial Fishery

US fishermen have been landing squid along east coast of the US since the 1880's (Kolator and Long 1978) but early fisheries were minor in scope. Focused effort began in 1968 by The Union of Soviet Socialist Republics and Japanese vessels. Reported foreign landings of longfin squid increased from 2000 mt in 1964 to a peak of 36,500 mt in 1973. Foreign longfin squid landings averaged 29,000 mt for the period 1972-1975.

Foreign fishing for longfin squid began to be regulated with the advent of extended fishery jurisdiction in the US in 1977. Initially, US regulations restricted foreign vessels fishing for squid (and other species) to certain areas and times (the so-called foreign fishing "windows"), primarily to reduce spatial conflicts with domestic fixed gear fishermen and minimize bycatch of non-target species. Later, foreign allocations were reduced and then eliminated as the domestic fishery became established. The development and expansion of the US squid fishery occurred relatively slowly as the US industry did not develop the appropriate technology to catch and process squid in offshore waters until the 1980's.

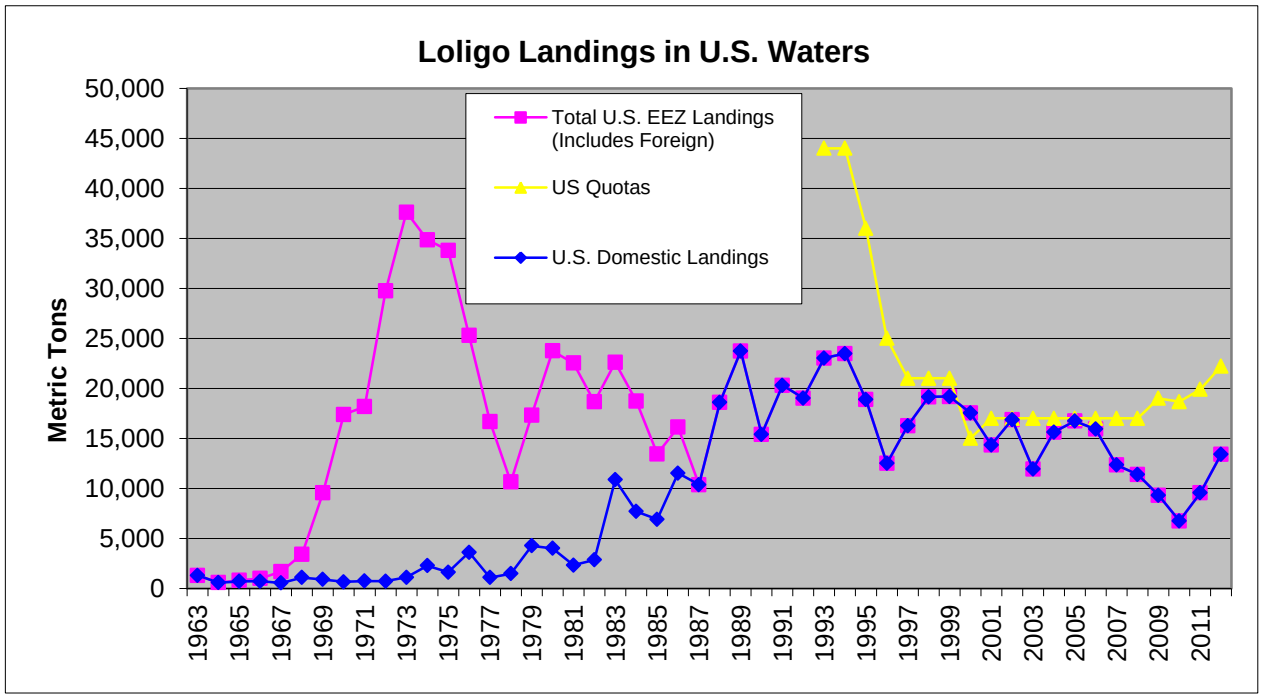


Figure 10. Historical Longfin Squid Landings in the U.S. EEZ.

Price (nominal) has increased fairly steadily since 1982 to $2,413/mt in 2012, even taking inflation into account (see Fishery Information Document at http://www.mafmc.org/ssc-meetings/2013/april-may for details). 2012 landings totaled 13,408 mt and generated $32.4 million in ex-vessel revenues. 2013 landings, while incomplete when this document was created, have been occurring at a slower pace compared to 2012.

Fishery Performance

The principle measure used to manage longfin squid is Trimester quota monitoring via dealer data that is submitted weekly. The dealer data triggers in-season management actions that institute relatively low trip limits when 90% of the Trimester quotas are reached in Trimesters 1 and 2 and when 95% of the annual DAH is reached in Trimester 3. The tables and figures on the subsequent pages describe quota performance, vessel participation, vessel dependency, distribution of landings by state/month/gear/port, dealer participation, and the general at-sea location of most recent catches.

The longfin squid DAH is currently divided up into trimesters and has been since 2007 while 2001-2006 had quarterly management. Each seasonal time period closes at a threshold of the seasonal allocation, which can result in seasonal closures. The seasonal closures that have occurred since 2002 are: **2002**: May 28-Jun30, Aug 16-Sep 30, Nov 2 -Dec 11, Dec 24-Dec31; **2003**: Mar 25-Mar 31; **2004**: Mar 5- Mar 31; **2005**: Feb 20-Mar 31, April 25-Jun 30, Dec 18-Dec 31; **2006**: Feb 13-Mar 31, April 21-April 26, May 23-June 30, Sept 2-Sept 30; **2007**: April 13-April 30; **2008**: July 17 - Aug 31; **2009**: Aug 6 - Aug 31; **2010**: No closures; **2011**: Aug 23 – Aug 31; **2012**: April 17 - April 30 (butterfish cap), July 10-August 31. There are occasional overages of the trimester quotas, but these are typically minor and should minimal effects since any Trimester 1 and 2 overages are applied to Trimester 3.

Table 32. Longfin Squid DAH Performance. (mt)

Year	Commercial Landings	Quota	Percent of Quota Landed
2003	11,941	17,000	70%
2004	15,629	17,000	92%
2005	16,720	17,000	98%
2006	15,920	17,000	94%
2007	12,343	17,000	73%
2008	11,394	17,000	67%
2009	9,307	19,000	49%
2010	6,749	18,667	36%
2011	9,554	19,906	48%
2012	13,408	22,220	60%

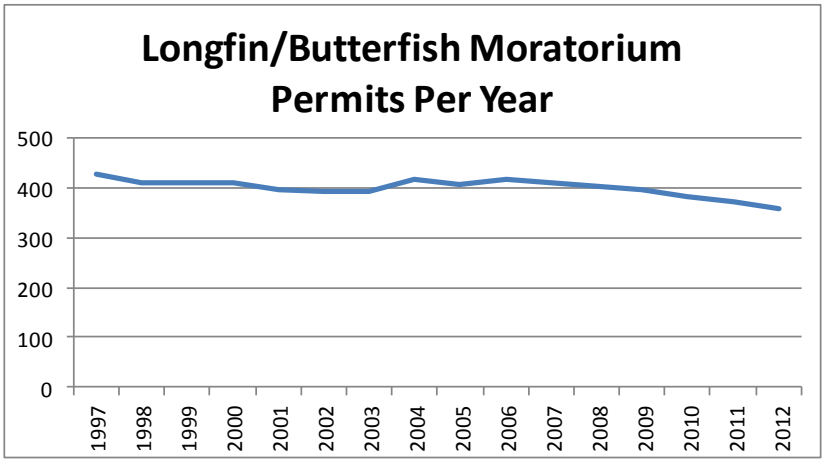
Source: Unpublished NMFS dealer reports

Table 33. 2012 Data for Permitted and Active Vessels by State

State of Principal Port	500,000 or more pounds	100,000-500,000 pounds	50,000-100,000 pounds	10,000-50,000 pounds
CT	.	4	2	2
MA	.	7	6	15
ME	.	1	1	1
NC	.	3	1	.
NH	.	1	4	.
NJ	.	6	5	7
NY	2	25	12	7
RI	6	28	6	6
VA	.	.	1	2

Source: Unpublished NMFS dealer reports and permit data.

Figure 11. Longfin Squid/Butterfish Moratorium Permits Per Year (Combination permit)



Source: Unpublished NMFS permit data.

Table 34. 2012 Vessel Dependence on Longfin Squid (revenue-based)

Dependence on Longfin	Number of Vessels in Each Dependency Category
1%-5%	42
5%-25%	73
25%-50%	64
More than 50%	33

Source: Unpublished NMFS dealer reports Not at State Level to Avoid Confidentiality Issues

Table 35. Recent Landings by State (mt)

YEAR	CT	MA	MD	ME	NA	NC	NJ	NY	RI
2010	166	701	1	0	25	32	713	1,769	3,342
2011	226	639	1	0	34	11	1,591	2,553	4,498
2012	1,280	1,335	1	5	35	1	1,893	3,556	5,302

Source: Unpublished NMFS dealer reports

Table 36. Recent Landings by Month (mt)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	524	336	289	271	781	533	632	274	720	1,082	727	579
2011	1,245	913	975	447	345	1,011	2,135	949	344	552	288	350
2012	362	365	691	1,071	2,147	2,754	2,472	897	805	1,116	296	434

Source: Unpublished NMFS dealer reports

Table 37. Recent Landings by Gear (mt)

YEAR	Bottom Trawl	Unknown	Midwater Trawl	Dredge	Trap/Pots/Pound/Weir	Other
2010	5,399	965	215	61	34	75
2011	8,050	1,319	91	54	13	26
2012	11,435	1,655	99	131	48	40

Source: Unpublished NMFS dealer reports

Table 38. Recent Ex-Vessel Revenues by Port for All Ports with at Least $200,000 Ex-Vessel Sales Combined Over last three years

YEAR	POINT JUDITH, RI	MONTAUK, NY	CAPE MAY, NJ	HAMPTON BAYS, NY	NORTH KINGSTOWN, RI	NEW BEDFORD, MA	NEW LONDON, CT
2010	$5,982,349	$2,859,112	$1,069,880	$807,223	$1,061,729	$919,771	$62,389
2011	$8,206,277	$3,792,870	$2,932,800	$2,643,944	$2,321,291	$1,128,010	$141,030
2012	$10,513,128	$4,700,714	$3,666,660	$3,071,927	$1,837,346	$1,084,906	$2,061,831

YEAR	BARNSTABLE, MA	STONINGTON, CT	POINT LOOKOUT, NY	BELFORD, NJ	POINT PLEASANT, NJ	WOODS HOLE, MA	FALMOUTH, MA
2010	$482,247	$249,570	$475,173	CI	CI	CI	CI
2011	$331,584	$360,612	$488,106	CI	CI	CI	CI
2012	$1,100,494	$1,243,286	$516,646	CI	CI	CI	CI

YEAR	NEWPORT, RI	SHINNECOCK, NY	EAST HAVEN, CT	FREEPORT, NY
2010	CI	CI	CI	CI
2011	CI	CI	CI	CI
2012	CI	CI	CI	CI

Source: Unpublished NMFS dealer reports

Table 39. Recent Numbers of Active Dealers

	Number of dealers buying at least $10,000 longfin	Number of dealers buying at least $100,000 longfin	Number of dealers buying at least $1,000,000 longfin
2010	18	22	4
2011	21	22	6
2012	20	26	7

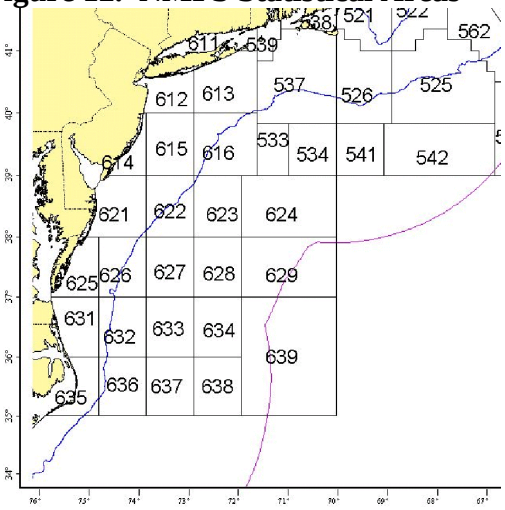
Source: Unpublished NMFS dealer reports

Table 40. Recent Catch in Statistical areas with at least 250 mt of longfin squid caught in at least one year of last three

YEAR	_616	_537	_622	_612	_613	_539	_538	_626	_525	_623	_611	_632	_562	_526
2010	2,505	604	1,043	475	474	333	199	173	348	52	226	275	224	51
2011	1,321	1,252	1,608	1,630	642	327	114	417	459	235	313	137	110	324
2012	1,419	2,501	1,244	1,765	1,699	407	722	385	114	433	174	130	95	12

Source: Unpublished VTR reports

Figure 12. NMFS Statistical Areas



Butterfish Catch/Mortality Cap

Beginning in 2011 the longfin squid fishery was subject to closure if it caught too much butterfish, with the cap divided up such that closures could occur in Trimesters 1 (Jan-Apr) and 3 (Sept-Dec). Framework 7 modified the cap to be a discard cap versus catch cap but the effect remained unchanged - butterfish mortality in the longfin squid fishery should be controlled. The cap is important for the longfin squid fishery because changes in the butterfish specifications, and the resulting cap amount, can have effects related to the "shadow value" of butterfish for the longfin squid fishery (longfin squid and butterfish are often caught together). Because of the butterfish cap, a constraint on total butterfish

catch may limit production in the squid fishery, so butterfish takes on a "shadow value" in terms of the indirect impact on the longfin squid fishery. While the exact relationship between butterfish and longfin squid catches cannot be precisely determined ahead of time for any given year, the "shadow value" of butterfish could be quite large; that is, the longfin squid fishery may recognize large increases in landings/revenues/profits from relatively small increases in the butterfish specifications (and vice-versa with decreases).

The cap also is important for butterfish management. The best available scientific information (NEFSC 2010) found the conclusions of the assessment that Amendment 10 (and the cap) was based on (NEFSC 2004) to be invalid. NMFS subsequently changed butterfish's status from overfished to unknown. However, since ACL overages of butterfish have to be paid back in following years, the cap serves to limit annual butterfish mortality to a given amount established by the SSC, which should both protect the butterfish stock and avoid negative impacts related to large paybacks if discarding was not monitored and controlled in each year in near real-time.

There were no cap closures in 2011. In 2012 there was a closure from April 17-30, although late-arriving data caused the closure rather than actual discards. 2013 was still underway at the time this document was written but a cap closure appears unlikely given early indications. Additional details on the cap estimation may be found here: http://www.nero.noaa.gov/nero/regs/frdoc/11/11SMB2011ButterfishSpecsRevisedCAP.pdf and a report on the 2011 operation of the cap may be found here: http://www.mafmc.org/meeting_materials/SSC/2012-05/SSC_2012_05.htm. Review of the cap's 2011 operation by the SSC in May 2012 found that the cap appears to be operating as designed, i.e. tracking and limiting butterfish mortality in the longfin squid fishery. It did also find that non-cap mortality also needs to be sufficiently accounted for to avoid ABC overages. As described in Section 5 of this document, the proposed butterfish specifications do account for non-cap mortality in 2014. Review of the cap's 2012 operation found that there were no ABC overages for butterfish in 2012, which was the first year that overages of butterfish catch limits must be paid back.

Longfin Squid Recreational Fishery

While there is definitely a recreational fishery for longfin squid, catch amounts have not been estimated – MRIP does not collect information on invertebrates. Based on qualitative research by Council staff, recreational fishing primarily occurs in the following modes: fishing from shore on manmade structures with artificial lighting at night; private boat fishing, charter boat fishing, and party/head boat fishing. Once the new MRIP methodology is fully in place the Council may request that additional information on squid catches be collected by MRIP interviewers. If individuals are looking for qualitative information on recreational squid fishing, the following site contains a variety of anecdotal information on recreational longfin squid fishing: http://www.squidfish.net/forums/index.php?/forum/18-east-coast/.

6.6.5 *Illex* Squid

There are no changes contemplated for *Illex* squid and in 2014 that fishery will be in year 3 of three-year specifications. For general information on the performance of the *Illex* squid fishery through 2011 please consult the Council's "*Illex* Fishery Information Document," available at: http://www.mafmc.org/meeting_materials/SSC/2012-05/SSC_2012_05.htm. Quota monitoring reports are also available at http://www.nero.noaa.gov/ro/fso/reports/reports_frame.htm.

7.0 WHAT ARE THE IMPACTS (Biological and Human Community) FROM THE ALTERNATIVES CONSIDERED IN THIS DOCUMENT?

The alternatives considered for 2014 are fully described in section 5. Related to the specifications, the key determinant of biological impact on the managed resources is how much fish can be caught as that limits effort. In recent years the mackerel, longfin squid, and *Illex* fisheries have not caught their entire quota. Thus even the status quo allows an expansion of catch. To the degree that extra effort is used to expand catch, impacts on non-target species, habitat, and protected resources could increase even under the status quo. Conversely, for the same reasons that catch has been lower than the quotas, catch and effort, and related impacts, could decrease under the status quo. Rather than repeat this concept for every resource, this document acknowledges that under any of the proposed alternatives effort and related impacts could increase or decrease for reasons other than the specifications. Also, the focus of analysis is on the relative upper limits imposed by the various specifications.

For habitat, protected resource, and non-target species impacts, the key determinant is not so much the catch itself but the amount and character of the related effort. A decrease in effort may result in positive impacts (+) as a result of fewer encounters and/or fewer habitat impacts from fishing gear, while an increase in effort may result in a negative impact (-). Similar effort likely results in neutral impacts (0). Table 41 illustrates that the availability of the target species can drive effort as much as any quota change, and as effort changes so would impacts on habitat, protected resource, and non-target species. This is noted in the habitat, protected resource, and non-target species sections since the MSB fisheries often experience large swings in availability and therefore effort independent of any regulatory changes.

Since limits on catch do cap effort, catch limits are a factor related to effort but many other factors at least somewhat beyond the control of the Council (such as fish abundance, availability of other opportunities, weather, climate, fish movements/availability, variable productivity, etc.) also affect how much and what sort of effort is utilized to land a given quantity of a given species of fish in any given year. Table 41 provides a general evaluation of how effort may change relative to changes in quota and fish abundance and/or availability, and highlights the complexity of predicting effort changes based on changes in management alone. This is especially true for the MSB species as they are subject to sometimes rapid fluctuations in abundance (how many fish are out there) and/or availability (how many fish are out there in places where the fishery can find and target them profitably enough to stimulate effort).

Note on research set-asides (RSA): The RSA quota is part of the overall quota for any species. If any portion of the 3-percent RSA quota of MSB species is not awarded to an RSA project, the remainder will be returned to the general fishery. With the exception of exemptions from possession limits and quota closures, the RSA quota will be harvested in the same manner as the commercial fishery. Therefore, it is unlikely that the pursuit of fish under any RSA project or RSA compensation fishing would have negative impacts on any part of the ecosystem compared to if the quota had been utilized by the directed fishery, since differences in how an RSA project uses the quota compared to the directed fishery are likely to be minor. Also, RSA projects usually test gears, survey approaches, and other projects that are hypothesized to improve the condition of the ecosystem, so any impacts are likely to be neutral to positive.

Table 41. Changes in effort as a result of adjustments to quota and/or fish availability.

Change in quota	Fish abundance/availability		
	Decrease in availability	**No change in availability**	**Increase in availability**
Decrease in quota	Fishing effort may decrease, increase, or stay the same depending on a combination of factors.	Effort likely to decrease or stay the same. If per trip catch stays the same, the fishery will be closed earlier with fewer trips taken (reducing effort). However managers may reduce trip limits or adjust regulations that extend the fishing season (keeping effort the same).	Effort likely to decrease or stay the same. A lower quota plus higher catch per unit of effort (CPUE) from higher availability should decrease effort. However, managers may reduce trip limits or adjust regulations that extend the fishing season which may keep effort relatively even.
No change in quota	Effort may increase or decrease. While the quota has not changed, fishermen may try to take more trips to catch the same amount of fish (increasing effort) or may stop targeting a stock of fish if availability is low enough to decrease profitability (decreasing effort).	Fishing effort may remain the same given the quota has not changed and availability is expected to be similar.	Effort should decrease. While the quota has not changed, fishermen should be able to take fewer trips to catch the same amount of fish (decreasing effort).
Increase in quota	Fishing effort likely to increase or stay the same. A higher quota plus lower catch per unit of effort from lower availability should increase effort. However, managers may increase trip limits or adjust regulations to allow more efficient fishing (keeping effort the same).	Effort likely to increase or stay the same. If per trip catch stays the same, the fishery will be closed later with more trips taken (increasing effort). However managers may increase trip limits or adjust regulations to allow more efficient fishing (keeping effort the same).	Fishing effort may decrease, increase, or stay the same depending on a combination of factors.

7.1 Biological Impacts on Managed Species

The impacts from the alternatives are described separately for each of the managed species: mackerel (7.1.1), butterfish (7.1.2), longfin squid (7.1.3), and *Illex* squid (7.1.4).

To facilitate tracking of alternatives in this impact section, a list of alternatives is provided first (all alternatives are detailed in Section 5):

1a - Status quo and no action regarding river herring and shad cap (no cap specified)
1b - PREFERRED- 236 metric tons (mt) river herring and shad cap
1c - low - 119 mt river herring and shad cap
1d - high - 456 mt river herring and shad cap
2a - Status quo and no action regarding longfin trip limits for Illex fishing after longfin closures (2,500 pounds)
2b - PREFERRED- 15,000 pound Trimester 2 post-closure longfin trip limit for Illex fishing
2c - 10,000 pound Trimester 2 post-closure longfin trip limit for Illex fishing
3a - Status quo and no action regarding butterfish trip limits
3b - PREFERRED- Change the phase 3 trip limit to 600 pounds
3c - Change the incidental trip limit to 500 pounds
4a - Status quo and no action regarding butterfish specifications: ABC= 8,400 mt, ACT= 7,560 mt, DAH= 2,570 mt, and butterfish cap= 3,884 mt.
4b - PREFERRED- ABC= 9,100 mt, ACT= 8,190 mt, DAH= 3,200 mt, and butterfish cap= 3,884 mt.
4c - high - ABC= 11,375 mt, ACT= 10,238 mt, DAH= 5,248 mt, and butterfish cap= 3,884 mt.
4d - low - ABC= 6,825 mt, ACT= 6,143 mt, DAH= 2,400 mt, and butterfish cap = 2,913 mt.

7.1.1 Impacts on Mackerel

Alternative Set 1 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery - All alternatives

Under the status quo with no cap (1a), U.S. mackerel landings have ranged from 1,463 metric tons to 10,649 metric tons over 2010-2012. Regardless of the RH/S cap's size and operation under the action alternatives, mackerel catch is controlled by other measures and should be limited such that overfishing does not occur. Thus impacts on the mackerel stock because of the RH/S cap are negligible regardless if the cap is set higher or lower since mackerel is still managed with its own quota. The RH/S cap may reduce mackerel catches if the mackerel fishery is closed. Lower caps would potentially result in lower mackerel landings, in order from most landings allowed to least of 1a - status quo (no cap), 1d - 456 mt, 1b - 236 mt, and then 1c - 119 mt. Again, even if less mackerel are caught, this would not be expected to substantially impact the mackerel stock, since catch is controlled independently to ensure sustainability, and external environmental drivers appear to be very important for mackerel abundance and distribution (TRAC 2010). This is consistent with Amendment 14, which found that if the mackerel fishery is closed because of the cap, mackerel catches would be lower than would otherwise occur, but are already managed separately.

Alternative Set 2 – Longfin Squid Regulatory Management Measures- Trimester 2 Longfin Squid Limit for *Illex* Fishing - All alternatives

Neither the status quo longfin trip limits (2a) nor the minor modifications to longfin squid trip limits for *Illex* fishing being considered (2b - 15,000 pound trip limit and 2c - 10,000 pound trip limit) should have any impacts on the mackerel fishery or mackerel stock since these are unrelated fisheries. This alternative set deals with longfin squid trip limits in Trimester 2 (May-August) and there is generally not substantial mackerel fishing activity in May-August. Thus all of these alternatives, status quo or action, should have equally negligible impacts on mackerel.

Alternative Set 3 – Match the Phase 3 and Incidental Trip Limits - All alternatives

Neither the status quo phase 3 or incidental butterfish trip limits (3a) nor the minor modifications to butterfish trip limits being considered (3b - change phase 3 trip limit to 600 pounds and 3c - change incidental trip limit to 500 pounds) should have any impacts on the mackerel fishery or mackerel stock since these alternatives only deal with the amount of incidentally-caught butterfish that may be retained while fishing for other species. Thus all of these alternatives, status quo or action, should have equally negligible impacts on mackerel.

Alternative Set 4 – Butterfish Specifications - All alternatives

Given the lack of substantial mackerel bycatch expected in butterfish or longfin fishing, and the direct controls that exist on mackerel fishing, it is not expected that any of the butterfish specifications under consideration would have any impact on the mackerel fishery or mackerel stock. Under the status quo (4a) mackerel fishing will primarily be driven by mackerel availability and market demand. Under the action alternatives that increase butterfish ABC (4b - 9,100 mt ABC and 4c - 11,375 mt) or the alternative that decreases butterfish ABC (4d - 6,825 mt), the primary driver of effort and catches of mackerel would still be mackerel availability and market demand as limited by the mackerel DAH, especially since the changes being considered for butterfish are relatively small. Any mackerel that happened to be caught while butterfish or longfin fishing are likely to be retained and counted against the mackerel DAH landings quota, further reinforcing the concept that because there are direct controls on mackerel fishing and landings, any status quo or action alternatives in the range being considered for butterfish specifications are likely to have equally negligible impacts on mackerel fishing or the mackerel stock.

7.1.2 Impacts on Butterfish

Alternative Set 1 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery - All alternatives

Given the lack of substantial butterfish bycatch expected in mackerel fishing, and the direct controls that exist on butterfish catch, it is not expected that any of the RH/S Cap specifications under consideration would have any impact on the butterfish stock. The butterfish specifications also leave some quota unallocated in order to anticipate discards in other fisheries. Since butterfish mortality is unlikely to be affected by either the status quo (no RH/S cap - 1a) or varying levels of the RH/S cap there are no impacts for butterfish related to any alternative in this alternative set. Lower caps would potentially result in lower mackerel landings/effort, in order from most allowed to least of 1a - status

quo (no cap), 1d - 456 mt, 1b - 236, and then 1c 119 mt. If butterfish were being incidentally caught this incidental catch would be reduced, but it is not expected to be significant. This is generally consistent with Amendment 14, which found that if the mackerel fishery is closed because of the cap, other MSB catches may be lower than would otherwise occur but are already managed separately.

Alternative Set 2 – Longfin Squid Regulatory Management Measures- Trimester 2 Longfin Squid Limit for *Illex* Fishing - All alternatives

These alternatives only impact the disposition of longfin squid that is caught incidentally during the *Illex* fishery and whether it may be retained or must be discarded. As such, no impacts on butterfish are anticipated. Under the status quo (2a), 2,500 pounds of longfin squid may be retained when the directed longfin fishery is closed. While longfin squid fishery closures do lead to less fishing mortality for butterfish, the issue at hand is not longfin squid closures but the limits on the Illex fishery, which typically catches minimal butterfish. While on occasion the higher longfin squid trip limits proposed in 2b (15,000 pounds) and 2c (10,000 pounds) for *Illex* fishing during Trimester 2 may theoretically provide opportunity for additional directed fishing on longfin squid (versus just retention of incidentally caught longfin squid) and thus butterfish incidental catch, such opportunities are not likely to be frequent enough to have any impacts that are more than negligible on the butterfish stock compared to the status quo or between the action alternatives. This is especially true since any trips that have more than 2,500 pounds of longfin squid would be counted against the butterfish cap. Thus any additional butterfish mortality would be accounted for and would not change the overall limit on butterfish mortality imposed by the specifications for the butterfish DAH and butterfish cap, even if 2b and to a lesser degree 2c led to slightly more longfin squid effort. Thus none of the alternatives, including the status quo, are likely to have any impacts on the butterfish stock.

Alternative Set 3 – Match the Phase 3 and Incidental Trip Limits - All alternatives

The status quo phase 3 (500 pounds) and incidental butterfish trip limits (600 pounds) (both are part of 3a) serve as part of the structure to limit overall butterfish mortality by limiting landings to an amount that should not result in an overall catch (landings plus discards) that is biologically unacceptable. The minor modifications to butterfish trip limits being considered in the action alternatives (3b - change phase 3 trip limit to 600 pounds and 3c - change incidental trip limit to 500 pounds) should not have any impacts on the butterfish fishery or butterfish stock compared to the status quo since the changes are so small. The only purpose and impact of the action alternatives is to make these trip limits identical to avoid regulatory confusion. 3b increases a trip limit for butterfish, but the change is so small the only affect is likely to be to convert some discards to landings compared to the status quo or 3c. Likewise, lowering the incidental trip limit to 500 pounds (3c) would probably just convert some landings to discards compared to the status quo or 3b. In either case overall butterfish mortality would likely be equal among all alternatives in this alternative set.

Alternative Set 4 – Butterfish Specifications

Recent extensions of the work conducted in the 2010 Assessment by the Northeast Fishery Science Center (NEFSC 2010 and Miller et al. (2013) – available at http://www.mafmc.org/ssc-meetings/2013/april-may), suggest that butterfish catch throughout the range being considered in the alternatives including the status quo (8,400 mt to 11,375 mt) would be unlikely to result in overfishing, i.e. would be unlikely to have a negative impact on the butterfish stock, as further described below.

4a – status quo – Specify an ABC of 8,400 mt, ACT of 7,560 mt, DAH of 2,570 mt, and Cap of 3,884 mt.

The available analyses (see Miller et al. (2013), also summarized above), data, and judgment of the Council's SSC suggest that the impact of 8,400 mt of fishing-related butterfish mortality will not be negative for the butterfish stock over a wide range of assumptions and criteria. Accordingly, the impact on butterfish from the status quo is likely best characterized as neutral with sustainability maintained.

4b – preferred alternative – Specify an ABC of 9,100 mt, ACT of 8,190 mt, DAH of 3,200 mt, and Cap of 3,884 mt.

The available analyses (see Miller et al. (2013), also summarized above), data, and judgment of the Council's SSC suggest that the impact of 9,100 mt of fishing-related butterfish mortality will not be negative for the butterfish stock over a wide range of assumptions and criteria. This catch level would be less protective of the butterfish stock than the Status quo of 8,400 mt but probably only minimally so, given the current information about the butterfish stock.

4c – high alternative – Specify an ABC of 11,375 mt, ACT of 10,238 mt, DAH of 5,248 mt, and Cap of 3,884 mt.

The available analyses (see Miller et al. (2013), also summarized above) and data suggest that the impact of 11,375 mt of fishing-related butterfish mortality will not be negative for the butterfish stock over a wide range of assumptions and criteria. This catch level would be less protective of the butterfish stock than the Status quo of 8,400 mt but probably only minimally so, given the current information about the butterfish stock. Alternative 4c could result in catch higher than the ABC provided by the Council's SSC however. Exceeding the SSC's ABC of 9,100 mt could potentially negatively impact the butterfish stock so the impact of 4c would be "low negative" compared to the status quo.

4d – low alternative – Specify an ABC of 6,825 mt, ACT of 6,143 mt, DAH of 2,400 mt, and Cap of 2,913 mt.

The available analyses (see Miller et al. (2013), also summarized above), data, and judgment of the Council's SSC suggest that the impact of 6,825 mt of fishing-related butterfish mortality will not be negative for the butterfish stock over a wide range of assumptions and criteria. This catch level would be more protective of the butterfish stock than the Status quo of 8,400 mt but probably only minimally so, given the current information about the butterfish stock.

Alternatives in this alternative set are likely to result in butterfish catches from least to highest in the following order: 4d, 4a, 4b, 4c. Since 4d, 4a, and 4b are at or below the SSC's ABC guidance, and fishing mortality for butterfish is thought to be quite low, impacts are expected to be the same for these three alternatives (maintained sustainability). Since 4c is higher than the SSC's ABC recommendation, impacts would be relatively negative for butterfish for 4c compared to 4d, 4a, and 4b.

7.1.3 Impacts on Longfin Squid

Alternative Set 1 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery - All Alternatives

Lower caps would potentially result in lower mackerel landings/effort, in order from most allowed to least of 1a - status quo (no cap), 1d - 456 mt, 1b - 236, and then 1c 119 mt. However, there is not substantial discarding of longfin squid in the mackerel fishery so any level of mackerel catch (including the status quo) is likely to have neutral impacts on longfin squid. Any incidental landings (again low) would be accounted for against the longfin squid landings quota, so again impacts should be neutral for any mackerel catch level (which could be reduced from the status quo by the RH/S cap). Thus for this alternative set, neither the status quo (1a) nor the alternatives that set a RH/S cap (4b-4d), are likely to have any impact on the longfin squid fishery or stock. This is generally consistent with Amendment 14, which found that if the mackerel fishery is closed because of the cap, other MSB catches may be lower than would otherwise occur if there are interactions, but the other MSB species are already managed separately.

Alternative Set 2 – Longfin Squid Regulatory Management Measures- Trimester 2 Longfin Squid Limit for *Illex* Fishing - All alternatives

The status quo Trimester 2 post-longfin squid directed fishery closure trip limits (2a - 2,500 pounds) would continue to help maintain the control of longfin squid landings that currently exists when the longfin squid fishery closes in Trimester 2. This is part of the overall system of limiting longfin squid catch to a biologically acceptable level. The status quo would maintain this control. The action alternatives in this alternative set 2b (15,000 pounds) and 2c (10,000 pounds) primarily impact the disposition of longfin squid that is caught incidentally during the *Illex* fishery in Trimester 2 during Trimester 2 longfin squid closures, i.e. whether it may be retained or must be discarded. As such, no impacts on longfin squid are anticipated from the action alternatives compared to the status quo or each other. While on occasion the higher longfin squid trip limits proposed in 2b (15,000 pounds) and 2c (10,000 pounds) may theoretically provide opportunity for additional directed fishing on longfin squid (versus just retention of incidentally caught longfin squid), such opportunities are not likely to be frequent enough to have any impacts that are more than negligible compared to the status quo or each other, and any additional landings would be monitored and accounted for (any Trimester 2 overages are deducted from Trimester 3). If longfin squid discards are converted to landings under the action alternatives 2b-2c, this could be a minor benefit to longfin squid stocks since it is easier to track and account for landings compared to discards. However, since overall discards of longfin squid are low and part of the overall catch is set-aside for discards, any impacts are likely to be negligible compared to the status quo or between alternatives. If some additional targeting occurs, catch could be lowest with the status quo, slightly higher with 2c, and slightly higher again with 2b. However since landings are tracked and regulated, all of the catches expected to be associated with these alternatives should maintain the sustainability of the longfin squid resource, and have equally negligible effects on the actual longfin stock.

Alternative Set 3 – Match the Phase 3 and Incidental Trip Limits - All alternatives

Neither the status quo phase 3 or incidental butterfish trip limits (3a) nor the minor modifications to butterfish trip limits being considered (3b - change phase 3 trip limit to 600 pounds and 3c - change incidental trip limit to 500 pounds) should have any impacts on the longfin squid fishery or longfin squid stock since these alternatives only deal with the amount of incidentally-caught butterfish that may be retained while fishing for other species. The changes being considered are also very minor. Thus the impacts for longfin squid are equally negligible between the action alternatives and with the status quo.

Alternative Set 4 – Butterfish Specifications - All alternatives

The butterfish specifications control the amount of butterfish catch and do not directly affect the longfin squid stock. The butterfish catch alternatives do impact the butterfish cap amount, which indirectly impacts the amount of longfin squid that is caught. However, the status quo cap has not closed the longfin squid fishery. 4b and 4c also maintain the status quo cap (only the butterfish landings quota/DAH changes), so no change compared to the status quo would be expected for 4b and 4c or between each other in terms of longfin squid impacts. Also, the slight reduction in the butterfish cap considered in 4d also would not have been constraining on the longfin squid fishery given recent performance, so again no impacts would be expected compared to the status quo or other action alternatives. In addition, because of direct controls on the longfin squid fishery, longfin squid catches should stay below the longfin squid ABC regardless of any butterfish catch level (including the status quo 4a, or the action alternatives 4b, 4c, and 4d), reinforcing that negligible impacts would be expected for longfin squid related to any butterfish alternatives in this alternative set. If the cap were to become constraining and limit longfin squid catch/effort, one would expect equal longfin catches with 4a, 4b, and 4c. One would expect longfin catches with 4d to be lower than the others if the cap is constraining, but again no actual impacts on the longfin squid stock would be expected.

7.1.4 Impacts on *Illex* Squid

The *Illex* squid fishery is sufficiently separate from the mackerel, longfin squid, and butterfish fisheries (which all of the alternative sets address) that one would not expect any impacts to the *Illex* stock from any of the status quo or action alternatives considered in this document. Even if there is incidental catch of *Illex* in these other fisheries (and there is some, especially in the longfin squid fishery in the summer and fall), because direct controls on the *Illex* squid fishery and a set-aside for discards exist, *Illex* squid catches should stay below the *Illex* ABC regardless, so equally negligible impacts would be expected for *Illex* squid related to any alternatives (including the status quo) in the alternative sets considered in this document.

Since Alternative Set 2 addresses longfin squid catch in the *Illex* fishery some additional discussion of this alternative set is warranted. Currently during a Trimester 2 longfin squid closure all vessels have a 2,500 pound longfin squid trip limit (i.e. the status quo alternative 2a). Alternative 2b would increase that limit to 15,000 pounds for the *Illex* fishery and Alternative 2c would increase that limit to 10,000 pounds. There is no information suggesting that the potential regulatory discarding under the status quo (2a) or the relief from that potential discarding under 2b (15,000 pounds) and 2c (10,000 pounds) impacts the overall conduct of the *Illex* fishery – it just impacts whether longfin squid caught during *Illex* fishing can be retained or must be discarded. Thus like the other alternative sets, impacts for *Illex* related to the status quo or action alternatives for Alternative Set 2 are expected to be equally negligible.

Managed Species Impacts Summary

The Status quo alternatives should continue to be protective of the MSB stocks. Most of the action alternatives considered in this document should have no or similar impacts on the managed species relative to how the fishery would be conducted with the status quo alternatives. The only exception is that 4c (using a butterfish ABC higher than that recommended by the SSC) may have a low negative impact for the butterfish stock compared to the status quo and other action alternatives (by allowing too much butterfish catch).

7.2 Habitat Impacts

Note: As discussed in table 41, the availability of the targeted species may drive effort (and habitat impacts) as much as quotas and other regulations. Impacts on the habitat for the managed species (7.2.1) and other species (7.2.2) are addressed separately.

To facilitate tracking of alternatives in this impact section, a list of alternatives is provided first (all alternatives are detailed in Section 5):

1a - Status quo and no action regarding river herring and shad cap (no cap specified)
1b - PREFERRED- 236 metric tons (mt) river herring and shad cap
1c - low - 119 mt river herring and shad cap
1d - high - 456 mt river herring and shad cap
2a - Status quo and no action regarding longfin trip limits for Illex fishing after longfin closures (2,500 pounds)
2b - PREFERRED- 15,000 pound Trimester 2 post-closure longfin trip limit for Illex fishing
2c - 10,000 pound Trimester 2 post-closure longfin trip limit for Illex fishing
3a - Status quo and no action regarding butterfish trip limits
3b - PREFERRED- Change the phase 3 trip limit to 600 pounds
3c - Change the incidental trip limit to 500 pounds
4a - Status quo and no action regarding butterfish specifications: ABC= 8,400 mt, ACT= 7,560 mt, DAH= 2,570 mt, and butterfish cap= 3,884 mt.
4b - PREFERRED- ABC= 9,100 mt, ACT= 8,190 mt, DAH= 3,200 mt, and butterfish cap= 3,884 mt.
4c - high - ABC= 11,375 mt, ACT= 10,238 mt, DAH= 5,248 mt, and butterfish cap= 3,884 mt.
4d - low - ABC= 6,825 mt, ACT= 6,143 mt, DAH= 2,400 mt, and butterfish cap = 2,913 mt.

7.2.1 Impacts on Managed Species Habitat

EFH for the managed species generally consists of the water column, which is not significantly impacted by fishing activity. The exception to the EFH location being the water column is longfin squid eggs, which are attached to sand, mud, or bottom structure (manmade or natural). However, as determined in Amendment 9, there is no indication that squid eggs are preferentially attached to substrates that are vulnerable to disturbance from fishing, so no impacts on EFH for longfin squid eggs are expected from any increase or decrease in fishing effort by bottom trawls. This means that the impact for managed species habitat for any of the status quo alternatives is neutral, as is the impact of any of the action alternatives. This is the same finding as was included in Amendment 14.

7.2.2 Impacts on Other Federally Managed Species Habitat (see table 12)

Alternative Set 1 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery - All alternatives

The status quo alternative (1a - no RH/S cap) would not impact mackerel effort levels while the action alternatives could reduce mackerel effort levels. 1c (119 mt) is the smallest cap and would have the potential to reduce mackerel effort the most compared to the status quo if RH/S cannot be avoided, followed by 1b (239 mt) and 1d (456 mt) in descending order of impact. Again the degree of impact would depend on how well the mackerel fishery could avoid RH/S, as well as general mackerel availability. While this alternative set could impact mackerel effort levels, mackerel are primarily caught with mid-water trawl gear, which should not substantially impact the bottom so any impacts on habitat of other federally managed species should be negligible with the status quo (no RH/S cap) or any of the action alternatives. This is basically the same finding as was included in Amendment 14, which also noted that since mid-water trawl gear is used, habitat impacts should be negligible.

Alternative Set 2 – Longfin Squid Regulatory Management Measures- Trimester 2 Longfin Squid Limit for *Illex* Fishing - All alternatives

The status quo Trimester 2 post-longfin squid directed fishery closure trip limits (2a - 2,500 pounds) would help maintain the control of longfin squid landings that currently exists when the longfin squid fishery closes in Trimester 2. This is part of the overall system of limiting longfin squid catch to a biologically acceptable level, which also limits effort and therefore habitat impacts. The status quo would maintain this control, and habitat impacts from the longfin squid fishery are described in Section 6. Longfin squid are caught in bottom trawls, which have the potential to adversely impact seafloor habitat. The Council has already minimized to the extent practicable impacts to other fish EFH by the MSB fisheries through closure of several canyon areas in MSB Amendment 9 (http://www.mafmc.org/fmp/history/smb-hist.htm) and Tilefish Amendment 1 (http://www.mafmc.org/fmp/history/tilefish.htm). The Council is also considering protections for Deep Sea Corals via Amendment 16.

The action alternatives in this alternative set 2b (15,000 pounds) and 2c (10,000 pounds) only impact the disposition of longfin squid that is caught incidentally during the *Illex* fishery in Trimester 2 during Trimester 2 longfin squid closures, and whether it may be retained or must be discarded. As such, no impacts on effort are anticipated compared to the status quo. While on occasion the higher longfin squid trip limits proposed in 2b (15,000 pounds) and 2c (10,000 pounds) may theoretically provide opportunity for additional directed fishing on longfin squid (versus just retention of incidentally caught longfin squid), such opportunities are not likely to be frequent enough to have any effort and therefore habitat impacts that are more than negligible compared to the status quo. If some additional targeting occurs, effort could be lowest with the status quo, slightly higher with 2c, and slightly higher again with 2b, and negative impacts to habitat could increase in the same fashion as effort. However, any additional Trimester 2 landings would be accounted for and could translate into an earlier Trimester 3 closure, negating any increase in overall effort.

Alternative Set 3 – Match the Phase 3 and Incidental Trip Limits - All alternatives

The status quo (3a) allows retention of some incidentally caught butterfish (500 pounds) by longfin squid-butterfish moratorium permitted vessels once the directed fishery has fully closed (Phase 3). Likewise the status quo allows 600 pounds of landings year-round for incidental permit holders. The minor modifications in 3b (both cases above would be 600 pounds) and 3c (both cases above would be 500 pounds) to butterfish trip limits should not have any impacts on fishery effort, so they should have no habitat impacts compared to the status quo or each other. They are only intended to prevent regulatory confusion about what the butterfish trip limit is during Phase 3 of the butterfish fishery by matching the incidental and Phase 3 trips limits.

Alternative Set 4 – Butterfish Specifications

4a – status quo – ABC of 8,400 mt, ACT of 7,560 mt, DAH of 2,570 mt, and Cap of 3,884 mt.

Impacts on habitat would likely remain about the same if the status quo is maintained. There is some directed fishing for butterfish at current levels, and bottom-tending mobile gear is utilized, which has the potential to impact seafloor habitat. Effort is likely to take place over sand/mud bottoms given sand/mud/rock bottoms are the preferred substrates for butterfish (see butterfish EFH Source Document, NMFS 1999, for details). Bottom-tending mobile gear will generally avoid rocky areas that cause gear damage unless catches would be higher over rocky areas, which is not known to be the case with butterfish. The butterfish ACT also can limit longfin squid effort due to the butterfish cap. Longfin squid are caught in bottom trawls, which have the potential to adversely impact seafloor habitat. The Council has already minimized to the extent practicable impacts to other fish EFH by the MSB fisheries through closure of several canyon areas in MSB Amendment 9 (http://www.mafmc.org/fmp/history/smb-hist.htm) and Tilefish Amendment 1 (http://www.mafmc.org/fmp/history/tilefish.htm). The Council is also considering protections for Deep Sea Corals via Amendment 16.

4b – preferred– ABC of 9,100 mt, ACT of 8,190 mt, DAH of 3,200 mt, and Cap of 3,884 mt.
4c – high alternative – ABC of 11,375 mt, ACT of 10,238 mt, DAH of 5,248 mt, and Cap of 3,884 mt.

(Both 4b and 4c are higher than the status quo and are treated together.)

Since the proposed cap amount would remain the same as the status quo (3,884 mt), there is no indirect impact on longfin effort compared to the status quo for 4b and 4c. The ACT increases could affect butterfish effort through landings quotas increasing. The above ACTs involve an increase from the current DAH of 2,570 mt to 3,200 mt for 4b, and to 5,248 mt for 4c. These are increases of 630 mt for 4b, and 2,678 mt for 4c. While these involve relatively large percentage increases, overall effort changes are not expected to be more than minimal compared to the status quo as described in the following paragraph.

In 2001, the last year of substantial directed butterfish fishing, it only took the 10 largest trips by just two vessels to catch 2,214 mt (an average of 221 mt per trip), about the amount of the largest potential increase considered. These trips spent 86 days at sea and with likely a day of travel at the beginning and end for offshore fishing, likely spent around 66 days fishing, a very small number compared to overall bottom trawl activity. For perspective compared to just one other fishery, in 2011 there were

1,326 fishing trips that landed more than 2,500 pounds of longfin squid and many of those trips fish for multiple days. The increase under the preferred alternative could amount to just 3 trips (the landings increase under the preferred alternative 4b is 630 mt, and if a trip can catch 221 mt then 3 trips could catch the additional landings in the preferred alternative). Furthermore, those vessels might not actually expend extra total bottom trawl activity to pursue butterfish but may target butterfish when they would have otherwise been targeting longfin squid. Thus the increases to the butterfish ACT in the preferred alternative may only lead to a few additional butterfish trips, and may not lead to any appreciable change in total effort utilizing bottom-tending mobile gear compared to the status quo, as longfin squid fishing uses the same gear. If such redirection occurs, due to similar habitat preferences of butterfish and longfin squid, the fishing activity would likely occur in similar habitats and as detailed in section 5, recent catches of butterfish and longfin squid have occurred in similar statistical areas. Thus total effort changes should be negligible, which means that impacts on habitat should be negligible but negative in direction compared to the status quo for 4b. Alternative 4c would involve an increase of 2,678 mt, which could stimulate more effort toward butterfish (though maybe only 12 trips if the trips landed 221 mt each), and therefore more habitat impacts compared to 4b, 4d, or the status quo, but still probably not more than minimal compared to the overall amount of bottom trawling effort.

4d – low alternative – Specify an ABC of 6,825 mt, ACT of 6,143 mt, DAH of 2,400 mt, and Cap of 2,913 mt.

Since the changes in the specifications from the status quo to 4d are small, and the specifications in 4d would not have been binding in recent years (for either butterfish DAH or the cap), impacts are likely to be negligible compared to the status quo. Since these specifications are lower than the status quo or 4b and 4c there theoretically could be some reduction in effort compared to the effort that could occur under the status quo, 4b, or 4c, but since the levels in 4d would not have been constraining in recent years overall impacts on habitat should be negligible for the action alternative 4d compared to the status quo or other action alternatives, even if they are positive in direction.

Thus overall for Alternative Set 4, one would expect landings, and effort, to be lowest with 4d, then higher with 4a, 4b, and 4c in that order. Habitat impacts track fishing effort, so habitat impacts would be lowest with 4d, then higher with 4a, 4b, and 4c in that order.

Habitat Impacts Summary

Status quo MSB fishing does impact habitat, but impacts have been minimized to the extent practicable by other actions. The alternatives considered in this document, and especially the preferred alternatives, are likely to have negligible impacts on effort by bottom-tending gear.

The increase to the longfin squid trip limit for *Illex* fishing (2b, 2c) could have minimally negative impacts.

Increases to the butterfish DAH/landings quota (4b, 4c) could have negative impacts in terms of direction, but are likely negligible in terms of their intensity. Decreases to the butterfish DAH/landings quota and butterfish cap (4d) could have positive impacts in terms of direction, but again are likely negligible in terms of their intensity.

7.3 Impacts on Protected Resources

Note: As discussed in table 41, the availability of the targeted species may drive effort (and impacts on protected resources) as much as quotas and other regulations.

To facilitate tracking of alternatives in this impact section, a list of alternatives is provided first (all alternatives are detailed in Section 5):

1a - Status quo and no action regarding river herring and shad cap (no cap specified)
1b - PREFERRED- 236 metric tons (mt) river herring and shad cap
1c - low - 119 mt river herring and shad cap
1d - high - 456 mt river herring and shad cap
2a - Status quo and no action regarding longfin trip limits for Illex fishing after longfin closures (2,500 pounds)
2b - PREFERRED- 15,000 pound Trimester 2 post-closure longfin trip limit for Illex fishing
2c - 10,000 pound Trimester 2 post-closure longfin trip limit for Illex fishing
3a - Status quo and no action regarding butterfish trip limits
3b - PREFERRED- Change the phase 3 trip limit to 600 pounds
3c - Change the incidental trip limit to 500 pounds
4a - Status quo and no action regarding butterfish specifications: ABC= 8,400 mt, ACT= 7,560 mt, DAH= 2,570 mt, and butterfish cap= 3,884 mt.
4b - PREFERRED- ABC= 9,100 mt, ACT= 8,190 mt, DAH= 3,200 mt, and butterfish cap= 3,884 mt.
4c - high - ABC= 11,375 mt, ACT= 10,238 mt, DAH= 5,248 mt, and butterfish cap= 3,884 mt.
4d - low - ABC= 6,825 mt, ACT= 6,143 mt, DAH= 2,400 mt, and butterfish cap = 2,913 mt.

Alternative Set 1 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery

Note: These impacts are consistent with the findings in Amendment 14, which noted that if the directed mackerel fishery is closed earlier than would otherwise occur because of a mortality cap, protected species benefit due to the resulting reduction in effort.

1a – status quo – No cap would be implemented.

Due to the year-to-year variation in catch and effort in the mackerel fishery, it is difficult to quantify protected species impacts. Section 6.4 describes the available information on recent interactions between the mackerel fishery and endangered and other protected species. Since the mackerel fishery overlaps with some marine mammal distributions, some marine mammal interactions are possible with the species highlighted in Section 6.4. The distribution of sea turtles also overlaps with the operation of the mackerel fishery. However, most of these species, including green, Kemp's ridley and loggerhead sea turtles, stay close to the coast feeding on bottom dwelling species (i.e., crabs) or vegetation where the mackerel fishery is less likely to occur and no interactions have been observed. Leatherbacks generally do not prey on fish and are unlikely to be attracted to operations of this fishery. While consumption of mackerel by Loggerheads has been documented, loggerheads do not generally target fast-moving fish such as mackerel (Dodd 1988). Thus, interactions between sea turtles and the mackerel fishery are not anticipated. Atlantic sturgeon occurs in the mackerel fishing area throughout the mackerel fishing season. The Stein et al. (2004a) review of sturgeon bycatch from 1989-2000 showed no observed sturgeon bycatch on vessels targeting Atlantic mackerel. See Section 6.4 for additional information on Atlantic sturgeon interactions in small-mesh otter trawl fisheries. Without

implementation of a RH/S cap (i.e. the status quo), similar impacts would be expected.

1b – preferred alternative – A RH/S cap of 236 mt would be implemented.
1c – low alternative – A RH/S cap of 119 mt would be implemented.
1d – high alternative – A RH/S cap of 456 mt would be implemented.

Because they only differ in degree, 1b, 1c, and 1d are addressed together. By shutting down the mackerel fishery if it reaches the RH/S cap, these alternatives may reduce mackerel effort compared to the status quo. This effort reduction could have some positive impact to protected resources in 2014, and would depend on mackerel availability and RH/S encounter rates (which would affect overall mackerel effort). The lower the cap is set, the less RH/S will be caught in 2014 before the mackerel fishery is shut down, and presumably the higher the benefit compared to the status quo because effort would be reduced. Thus all the action alternatives (1b, 1c, and 1d) could benefit protected resources that are impacted by the mackerel fishery, as detailed in Section 6.4, compared to the status quo. 1c (119 mt) would provide the most benefit, 1d (456 mt) would provide the least benefit, and 1b (236 mt) would provide an intermediate benefit.

Alternative Set 2 – Longfin Squid Regulatory Management Measures- Trimester 2 Longfin Squid Limit for *Illex* Fishing - All alternatives

The status quo Trimester 2 post-longfin squid directed fishery closure trip limits (2a - 2,500 pounds) would help maintain the control of longfin squid landings that currently exists when the longfin squid fishery closes in Trimester 2. This is part of the overall system of limiting longfin squid catch to a biologically acceptable level, which also limits effort and therefore protected resource impacts in the longfin squid fishery, which are detailed in section 6.4. The status quo would maintain this control and impacts would be expected to be similar to previous years. The action alternatives in this alternative set 2b (15,000 pounds) and 2c (10,000 pounds) only impact the disposition of longfin squid that is caught incidentally during the *Illex* fishery in Trimester 2 during Trimester 2 longfin squid closures, and whether it may be retained or must be discarded. As such, no impacts on effort are anticipated compared to the status quo. While on occasion the higher longfin squid trip limits proposed in 2b (15,000 pounds) and 2c (10,000 pounds) may theoretically provide opportunity for additional directed fishing on longfin squid (versus just retention of incidentally caught longfin squid), such opportunities are not likely to be frequent enough to have any effort and therefore protected resource impacts that are more than negligible compared to the status quo. If some additional targeting occurs, effort could be lowest with the status quo, slightly higher with 2c, and slightly higher again with 2b, and negative impacts to protected resources could increase in the same fashion as effort. However, any additional Trimester 2 landings would be accounted for and could translate into an earlier Trimester 3 closure, negating any increase in overall effort.

Alternative Set 3 – Match the Phase 3 and Incidental Trip Limits - All alternatives

Current impacts from bottom trawling are described in section 6.4. The status quo (3a) allows retention of some incidentally caught butterfish (500 pounds) by longfin squid-butterfish moratorium permitted vessels once the directed fishery has fully closed (Phase 3). Likewise the status quo allows 600 pounds of landings year-round for incidental permit holders. Protected resource impacts would thus be expected to be similar to previous years under the status quo. The minor modifications in 3b (both cases above would be 600 pounds) and 3c (both cases above would be 500 pounds) to butterfish trip limits should not have any impacts on fishery effort, so they should have no protected resource impacts compared to the status quo or each other. They are only intended to prevent regulatory confusion about what the butterfish trip limit is during Phase 3 of the butterfish fishery by matching the incidental and Phase 3 trips limits.

Alternative Set 4 – Butterfish Specifications

The basic interactions between small mesh bottom trawl fisheries and protected resources are discussed in section 6.4. Under the status quo (4a), these interactions would continue but are monitored and mitigation alternatives would be developed if necessary. As detailed above in the habitat impact analysis for this alternative set, any of the butterfish DAH/landings quota increases proposed in alternative set 4 (4b, 4c) are likely to lead to only a minimal increase in overall fishing effort compared to the status quo. 4d, which considers a reduction to both butterfish DAH/landings and the butterfish cap, could lead to only a minimal decrease in overall fishing effort compared to the status quo (the specifications in 4d would not have been binding in recent years). Thus impacts from any of the action alternatives (4b, 4c, 4d) would be expected to be similar to the status quo because effort levels would be similar. Given the above, overall protected resource impacts from any of the action alternatives are best characterized as likely "negligible" compared to the status quo, but the preferred alternative 4b and alternative 4c would be slightly negative in direction compared to the status quo given the potential for minor effort increases. Thus overall for Alternative Set 4, one would expect landings, and effort, to be lowest with 4d, then higher with 4a, 4b, and 4c in that order. Protected resource impacts track fishing effort, so protected resource impacts would be lowest with 4d, then higher with 4a, 4b, and 4c in that order.

Protected Resources Impacts Summary

Status quo impacts are described in section 6.4 and summarized above in this section. Most of the action alternatives considered in this document should have similar impacts relative to the status quo. The RH/S cap action alternatives (1b-1d) could decrease mackerel effort and therefore have positive impacts for protected species that interact with the mackerel fishery. Lower caps would likely have higher benefits (1b = 236 mt, 1c = 119 mt, and 1d = 456 mt).

The higher longfin trip limits (2b, 2c) could have minor negative impacts.

Increases to the butterfish DAH/landings quota (4b, 4c) could have negative impacts in terms of direction, but are likely negligible in terms of their intensity. Decreases to the butterfish DAH/landings quota and butterfish cap (4d) could have positive impacts in terms of direction, but again are likely negligible in terms of their intensity.

7.4 Socioeconomic Impacts

Note: As discussed in table 41 and accompanying text, the availability of the targeted species may drive effort (and catch and revenues) as much as quotas and other regulations.

To facilitate tracking of alternatives in this impact section, a list of alternatives is provided first (all alternatives are detailed in Section 5):

1a - Status quo and no action regarding river herring and shad cap (no cap specified)
1b - PREFERRED- 236 metric tons (mt) river herring and shad cap
1c - low - 119 mt river herring and shad cap
1d - high - 456 mt river herring and shad cap
2a - Status quo and no action regarding longfin trip limits for Illex fishing after longfin closures (2,500 pounds)
2b - PREFERRED- 15,000 pound Trimester 2 post-closure longfin trip limit for Illex fishing
2c - 10,000 pound Trimester 2 post-closure longfin trip limit for Illex fishing
3a - Status quo and no action regarding butterfish trip limits
3b - PREFERRED- Change the phase 3 trip limit to 600 pounds
3c - Change the incidental trip limit to 500 pounds
4a - Status quo and no action regarding butterfish specifications: ABC= 8,400 mt, ACT= 7,560 mt, DAH= 2,570 mt, and butterfish cap= 3,884 mt.
4b - PREFERRED- ABC= 9,100 mt, ACT= 8,190 mt, DAH= 3,200 mt, and butterfish cap= 3,884 mt.
4c - high - ABC= 11,375 mt, ACT= 10,238 mt, DAH= 5,248 mt, and butterfish cap= 3,884 mt.
4d - low - ABC= 6,825 mt, ACT= 6,143 mt, DAH= 2,400 mt, and butterfish cap = 2,913 mt.

Alternative Set 1 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery

Note: These impacts are consistent with the findings in Amendment 14, which noted that lower caps lead to higher costs to fishery participants if the mackerel fishery is closed, but if the caps assist recovery of RH/S, then they might result in additional benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully).

1a – status quo – No cap would be implemented.

The mackerel fishery would continue to be limited by the mackerel quota. The socioeconomic benefits from mackerel fishing would continue, although the fishery is extremely variable with low catches in recent years. To the degree that mackerel fishing might be hindering recovery of RH/S stocks, those negative results of mackerel fishing would continue. Any potential gains from rebuilding RH/S that could occur as a result of limiting RH/S catch in the mackerel fishery (from RH/S fishing, indirect benefits via their role as forage, existence value, cultural value, etc.) would continue to be forgone.

1b – preferred alternative – A RH/S cap of 236 mt would be implemented.

To the degree that this cap level restricted mackerel fishing compared to the status quo, some value of mackerel fishing would be lost. The amount of loss would depend on the availability of mackerel in a given year, and the ratio of RH/S catch. Based on recent years, a cap of 236 would only be binding if

the mackerel fishery experiences a relatively high RH/S catch rate. If compared to recent years (see Table 3) the RH/S catch rate is on the low side, then the cap would not be binding, allowing the full mackerel quota to be caught. To the degree that limiting RH/S catch in the mackerel fishery helped recovery of RH/S stocks, then related benefits (from RH/S fishing, indirect benefits via their role as forage, existence value, cultural value etc.) would accrue compared to the status quo. Any cap would be more likely to close the fishery compared to no cap (the status quo), and this alternative (236 mt) would be more likely to result in a closure compared to 1d (456 mt) and less likely to result in a closure compared to 1c (119 mt). With a cap of 236 mt, relative to mackerel landings since 2010, which have been below 11,000 mt, the mackerel fishery would only be closed before it reached 11,000 mt if 2014 RH/S encounter rates were high compared to the range of recently observed encounter rates.

1c – low alternative – A RH/S cap of 119 mt would be implemented.

To the degree that this cap level restricted mackerel fishing compared to the status quo, some value of mackerel fishing would be lost. The amount of loss would depend on the availability of mackerel in a given year, and the ratio of RH/S catch. Based on recent years, a cap of 119 would probably be binding in most years unless RH/S rates were reduced from recent levels, especially if there are substantial mackerel landings. If compared to recent years the RH/S catch rate is on the very low side, then the cap could not be binding, allowing the full mackerel quota to be caught. To the degree that limiting RH/S catch in the mackerel fishery helped recovery of RH/S stocks, then related benefits (from RH/S fishing, indirect benefits via their role as forage, existence value, cultural value etc.) would accrue compared to the status quo. Any cap would be more likely to close the fishery compared to no cap (the status quo), and this alternative (119 mt) would be more likely to result in a closure compared to 1d (456 mt) or 1b (236mt). With a cap of 119 mt, relative to mackerel landings since 2010, which have been below 11,000 mt, the mackerel fishery would only be closed before it reached 11,000 mt if 2014 RH/S encounter rates were high compared to the range of recently observed encounter rates.

1d – high alternative – A RH/S cap of 456 mt would be implemented.

To the degree that this cap level restricted mackerel fishing compared to the status quo, some value of mackerel fishing would be lost. The amount of loss would depend on the availability of mackerel in a given year, and the ratio of RH/S catch. Based on recent years, a cap of 456 would probably not be binding in most years unless RH/S rates were relatively high compared to recent years. To the degree that limiting RH/S catch in the mackerel fishery helped recovery of RH/S stocks, then related benefits (from RH/S fishing, indirect benefits via their role as forage, existence value, cultural value etc.) would accrue compared to the status quo. Any cap would be more likely to close the fishery compared to no cap (the status quo), but this alternative (456 mt) would be otherwise the least likely to result in a closure. With a cap of 456 mt, relative to mackerel landings since 2010, which have been below 11,000 mt, the mackerel fishery would only be closed before it reached 11,000 mt if 2014 RH/S encounter rates were very high compared to the range of recently observed encounter rates.

Overall with Alternative Set 1, socio-economic impacts related to lost mackerel revenues would be least negative with 1a, followed by 1d, 1b, and 1c in that no cap or higher caps are less likely to constrain the mackerel fishery. The opposite is true for potential socio-economic benefits from recovering RH/S populations, in that smaller caps would have the most benefit (1c then 1b, 1d, and 1a in that order).

Alternative Set 2 – Longfin Squid Regulatory Management Measures- Trimester 2 Longfin Squid Limit for *Illex* Fishing

2a – status quo – All vessels would continue to be subject to the 2,500 pound post-directed fishery closure trip limit during Trimester 2 once the directed Trimester 2 fishery closes.

The primary mechanisms that affect the catches, and socioeconomic benefits, from longfin squid and *Illex* fishing are the annual quotas and the natural variability of squid abundance and availability. These would not be substantially impacted by any alternative in this action (they will be in the last year of 3-year multi-year specifications in 2014). The primary benefits that communities reap from harvesting squid should continue under the status quo; longfin squid and *Illex* fishery activity is discussed elsewhere in this document. To the extent that the status quo could lead to regulatory discarding or crews having to sort catch there are some costs associated with the status quo but given the limited data on the specific kinds of trips that would be impacted (*Illex* trips during a Trimester 2 longfin squid closure) it is not possible to quantify such costs.

2b – preferred alternative – 15,000 pound Trimester 2 Post-Closure longfin squid Trip Limit for *Illex* Fishing.
2c – middle alternative – 10,000 pound Trimester 2 Post-Closure longfin squid Trip Limit for *Illex* Fishing.

Because they are similar, 2b and 2c are addressed together. Both observer data and reports from fishermen suggest that *Illex* fishermen catch longfin squid in these quantities at least occasionally, and if such catches happen during a longfin squid closure in Trimester 2 then they would have to be discarded in order for the vessel to remain compliant. These alternatives could thus convert discards into landings, which could add revenues to fishery participants compared to the status quo. Recently (last 3-5 years) squid prices have often averaged about $1/pound (they were $1.09 in 2012), so theoretically these measures could add about $7,500 (2c) to $12,500 (2b) in revenues on any given trip compared to the status quo ($0 change), but it is not possible to estimate how many trips would take advantage of the higher trip limits, and there must be a Trimester 2 longfin squid closure for it to apply.

If these higher trip limits result in a Trimester 2 overage then the overage comes out of Trimester 3. However, in port meetings the Council held in 2013 prior to setting the specifications fishermen reported that many of the vessels that would benefit from higher longfin squid limits during *Illex* fishing are likely to be the same vessels that would be longfin squid fishing in Trimester 3, so any distributional issues should be minimal. These measures are not expected to result in substantial Trimester 2 overages but would be tracked and could be adjusted in future years if appropriate.

Alternative Set 3 – Match the Phase 3 and Incidental Trip Limits - All alternatives

Having the butterfish incidental trip limit (600 pounds) and the Phase 3 butterfish trip limit (500 pounds) be different (the status quo) could create confusion about what regulations apply to which fishermen. Aligning the trip limits (Alternative 3b (both 600 pounds) and 3c (both 500 pounds)) should provide benefits in terms of simplifying regulations compared to the status quo. Alternative 3b could provide the added benefit of slightly higher landings for moratorium permit holders, but 100 extra pounds of butterfish has only a small value (about 73 dollars). Alternative 3c could involve an added cost of having slightly lower landings for incidental permit holders, but 100 pounds of butterfish has only a small value (about 73 dollars).

Alternative Set 4 – Butterfish Specifications

4a – status quo – Specify an ABC of 8,400 mt, ACT of 7,560 mt, DAH of 2,570 mt, and Cap of 3,884 mt.

Under the status quo, the butterfish stock would continue to provide benefits to human communities related to sustainable fishing, dependent on year-to-year availability (see section 6). Butterfish catch levels must be analyzed in terms of their impact on both butterfish landings and longfin squid landings related to the butterfish cap. In 2012, the ex-vessel value of butterfish landings was $1.1 million dollars, from landings of 671 mt and a price of about $1,600/mt. 2013 landings appear likely to be somewhat higher. These landings also have a multiplied impact related to crew and support industries but a multiplier for butterfish is unavailable. The status quo would be likely to continue to support similar landings and revenues for human communities. In terms of the butterfish cap and longfin squid landings, the status quo butterfish catch levels (3,884 mt) have not caused a shutdown of the longfin squid fishery relative to the butterfish cap as of the time this document was written so there have been no impacts on the longfin squid fishery related to status quo butterfish catch levels as of yet. Longfin squid landings and revenues are described in section 6.

4b – preferred alternative – Specify an ABC of 9,100 mt, ACT of 8,190 mt, DAH of 3,200 mt, and Cap of 3,884 mt.

Compared to the status quo, this alternative would allow an additional 630 mt of potential landings. Since there have been no longfin squid shutdowns related to status quo butterfish cap levels, which are proposed to remain the same in this alternative, the primary quantifiable benefit of the higher, preferred catch levels would be additional butterfish landings. 4b would have a DAH landings level of 3,200 mt. This is 630 mt higher than the 2012 DAH. While 2013 landings appear likely to be well below the 2013 DAH (so raising the DAH may not result in additional landings), 630 mt of butterfish could result in additional potential landings compared to the status quo, which could translate into about $1 million dollars in additional ex-vessel revenues at 2012 prices. These additional revenues would also have a multiplied impact related to crew and support industries but a multiplier for butterfish is unavailable. It is not clear if prices would hold near $1,600/mt at higher landings volumes, so the gain in revenues may be lower.

4c – high alternative – Specify an ABC of 11,375 mt, ACT of 10,238 mt, DAH of 5,248 mt, and Cap of 3,884 mt.

Compared to the status quo, this alternative would allow an additional 2,678 mt of potential landings. Since there have been no longfin squid shutdowns related to Status quo butterfish cap levels, which are proposed to remain the same in this alternative, the primary quantifiable benefit of the higher, preferred catch levels would be additional butterfish landings. 4c would have a DAH landings level of 5,248 mt. This is 2,678 mt higher than the 2012 DAH. While 2013 landings appear likely to be well below the 2013 DAH (so raising the DAH may not result in additional landings), 2,678 mt of butterfish could result in additional potential landings compared to the status quo, which could translate into about $4 million dollars in additional ex-vessel revenues at 2012 prices. These additional revenues would also have a multiplied impact related to crew and support industries but a multiplier for butterfish is unavailable. It is not clear if prices would hold near $1,600/mt at higher landings volumes, so the gain in revenues may be lower.

4d – low alternative – Specify an ABC of 6,825 mt, ACT of 6,143 mt, DAH of 2,400 mt, and Cap of 2,913 mt.

Compared to the status quo, this alternative would allow 170 mt less potential landings than the status quo. Since there have been no longfin squid shutdowns related to butterfish cap levels at or above 2,913 mt, the primary quantifiable impact of these lower landings levels would be potentially foregone butterfish revenues. While 2013 landings appear likely to be well below the 2013 DAH (so lowering the DAH may not result in lower landings), 170 mt of butterfish could represent about $300,000 in potentially lost revenues. These additional revenues would also have a multiplied impact related to crew and support industries but a multiplier for butterfish is unavailable. It is not clear if prices would hold near $1,600/mt at landings volumes near the proposed 2,400mt, so the loss in revenues may be lower and overall similar compared to the status quo.

Overall with Alternative Set 4, socio-economic impacts related to fishery revenues from butterfish would be best with 4c, followed by 4b, 4a, and 4d.

Socioeconomic Impacts Summary

The river herring/shad caps have the potential to cause reductions in mackerel revenues. Gains made from improved RH/S abundance may offset these reductions to some degree. Lower caps would likely reduce mackerel revenues more over time, but could theoretically result in higher benefits related to conserving river herring and shad. Reducing regulatory discarding of longfin squid (set 2) and reducing regulatory confusion (set 3) should have minor positive socioeconomic impacts. Increasing the butterfish ABC/ACT/DAH should result in positive impacts, and reducing the butterfish ABC/ACT/DAH could result in negative impacts (set 4), but to a small degree given the small change in quotas.

7.5 Impacts on non-Target Fish Species

Note: Recent non-target species interactions in the MSB fisheries are summarized in Section 6.5. Also, as discussed in table 41, the availability of the targeted species may drive effort (and non-target fish species impacts) as much as quotas and other regulations.

To facilitate tracking of alternatives in this impact section, a list of alternatives is provided first (all alternatives are detailed in Section 5):

1a - Status quo and no action regarding river herring and shad cap (no cap specified)
1b - PREFERRED- 236 metric tons (mt) river herring and shad cap
1c - low - 119 mt river herring and shad cap
1d - high - 456 mt river herring and shad cap
2a - Status quo and no action regarding longfin trip limits for Illex fishing after longfin closures (2,500 pounds)
2b - PREFERRED- 15,000 pound Trimester 2 post-closure longfin trip limit for Illex fishing
2c - 10,000 pound Trimester 2 post-closure longfin trip limit for Illex fishing

3a - Status quo and no action regarding butterfish trip limits
3b - PREFERRED- Change the phase 3 trip limit to 600 pounds
3c - Change the incidental trip limit to 500 pounds
4a - Status quo and no action regarding butterfish specifications: ABC= 8,400 mt, ACT= 7,560 mt, DAH= 2,570 mt, and butterfish cap= 3,884 mt.
4b - PREFERRED- ABC= 9,100 mt, ACT= 8,190 mt, DAH= 3,200 mt, and butterfish cap= 3,884 mt.
4c - high - ABC= 11,375 mt, ACT= 10,238 mt, DAH= 5,248 mt, and butterfish cap= 3,884 mt.
4d - low - ABC= 6,825 mt, ACT= 6,143 mt, DAH= 2,400 mt, and butterfish cap = 2,913 mt.

Alternative Set 1 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery

Note: These impacts are consistent with the findings in Amendment 14, which noted that if mackerel closed earlier than it otherwise would there would be less catch of RH/S (and other non-target species) and that the lower the cap is set, the shorter the directed fishery will stay open, leading to more potentially positive impacts for non-target species due to lower fishing effort, including RH/S.

1a – status quo – No cap would be implemented.

Various species are caught incidentally by the mackerel fishery, as described in Section 6.5. For non-target species that are managed under their own FMP, incidental catch/discards are also considered as part of the management of that fishery. These species will be impacted to some degree by status quo prosecution of the mackerel fishery. Since mackerel is in multi-year level catch specifications, one would generally expect impacts on non-target species from the status quo to be approximately similar as those in recent years. Due to the year-to-year variation in catch and effort in the mackerel fishery related to fish availability, it is difficult to quantify non-target impacts. Generally mackerel has relatively low non-target species impacts, but catches of river herrings and shads (RH/S) are a concern. The 2013 specifications Environmental Assessment has details on RH/S catch, as does the EIS for Amendment 14 (both can be located at http://www.nero.noaa.gov/regs/). As described in Table 3 above, analysis suggests that in recent years, RH/S catches in the mackerel fishery have been in the range of 78 mt - 1273 mt (about 170,000 pounds to nearly 3,000,000 pounds) when the fishery is operating (i.e. 2006-2010 - mackerel catches were very low from 2011-2012 as illustrated in Table 14). Most of that catch would be expected to be river herring according to both Amendment 14 analyses and the ratios observed specifically on mackerel trips. RH/S incidental catch (retained and discarded) depends on the amount of total effort expended to catch mackerel and the RH/S encounter rate while fishing. Without the cap both of those would vary and RH/S catch would not be capped, but one might expect RH/S catches to be in the range of 78 mt - 1273 mt

The considered action alternatives for the cap in 2014 are:

1b – preferred alternative – A RH/S cap of 236 mt would be implemented.
1c – low alternative – A RH/S cap of 119 mt would be implemented.
1d – high alternative – A RH/S cap of 456 mt would be implemented.

Because they only differ in degree, 1b, 1c, and 1d are addressed together. By encouraging the fleet to avoid RH/S, or by shutting down the mackerel fishery if it reaches the RH/S cap, these alternatives may reduce RH/S catch and would definitely limit RH/S catch by the mackerel fishery compared to the status quo. This should have some positive impact to RH/S stocks in 2014, but there are no absolute abundance estimates for RH/S stocks. The lower the cap is, the less RH/S will be caught in 2014

before the mackerel fishery is shut down, and presumably the higher the benefit. Thus all the action alternatives (1b, 1c, and 1d) would benefit non-target species and especially RH/S more than the status quo in 2014. 1c (119 mt) would provide the most benefit, 1d (456 mt) would provide the least benefit, and 1b (236 mt) would provide an intermediate benefit.

Alternative Set 2 – Longfin Squid Regulatory Management Measures- Trimester 2 Longfin Squid Limit for *Illex* Fishing - All Alternatives

These alternatives only impact the disposition of longfin squid that is caught incidentally during the *Illex* fishery and whether it may be retained or must be discarded. As such, no impacts on non-target species are anticipated. Under the status quo (2a - 2,500 pound longfin squid trip limit for *Illex* fishing during longfin squid closures), longfin would still be caught but would be discarded when caught. While on occasion the higher longfin squid trip limits proposed in 2b (15,000 pounds) and 2c (10,000 pounds) may theoretically provide opportunity for additional directed fishing on longfin squid (versus just retention of incidentally caught longfin squid), such opportunities are not likely to be frequent enough to have any impacts on non-target species that are more than negligible compared to the status quo. If some additional targeting occurs, effort could be lowest with the status quo, slightly higher with 2c, and slightly higher again with 2b, and negative impacts to non-target species could increase in the same fashion as effort. However, any additional Trimester 2 landings would be accounted for and could translate to an earlier Trimester 3 closure, negating any overall effort change.

Alternative Set 3 – Match the Phase 3 and Incidental Trip Limits - All alternatives

The status quo (3a) allows retention of some incidentally caught butterfish (500 pounds) by longfin squid-butterfish moratorium permitted vessels once the directed fishery has fully closed (Phase 3). Butterfish fishing is likely to have some non-target interactions as described in section 6.5, but these are related to overall effort and not directly tied to the kinds of trip limits being considered in this action. Likewise the status quo allows 600 pounds of landings year-round for incidental permit holders. The minor modifications in 3b (both cases above would be 600 pounds) and 3c (both cases above would be 500 pounds) to butterfish trip limits should not have any impacts on fishery effort, so they should have no non-target impacts compared to the status quo or each other. They are only intended to prevent regulatory confusion about what the butterfish trip limit is during Phase 3 of the butterfish fishery by matching the incidental and Phase 3 trips limits.

Alternative Set 4 – Butterfish Specifications

4a – status quo – Specify an ABC of 8,400 mt, ACT of 7,560 mt, DAH of 2,570 mt, and Cap of 3,884 mt.

For non-target species that are managed under their own FMP, incidental catch/discards are also considered as part of the management of that fishery. The list of species taken incidentally and discarded in the butterfish fishery has not been calculated recently because recently there has been very limited directed fishing for butterfish because of regulations, market demand, and/or availability. It is also very difficult to identify a directed butterfish trip in the observer database and double counting with other fisheries would likely occur due to the incidental nature of the fishery. Prior specifications identified red hake, silver hake, spiny dogfish, scup, unclassified skates, fourspot flounder, longfin squid, mackerel, and little skate as primary bycatch and/or discard species in the butterfish fishery. These species are likely impacted to some degree by the fishery and would continue to be impacted in

a similar fashion under the status quo.

The butterfish specifications also impact the cap on the longfin squid fishery. This alternative proposes a status quo cap, thus no change in non-target impacts related to butterfish's potentially limiting influence on the longfin squid fishery would be expected. Non-target interactions from the longfin squid fishery have been described above in Section 6.

4b – preferred alternative – Specify an ABC of 9,100 mt, ACT of 8,190 mt, DAH of 3,200 mt, and Cap of 3,884 mt.
4c – high alternative – Specify an ABC of 11,375 mt, ACT of 10,238 mt, DAH of 5,248 mt, and Cap of 3,884 mt.

4b and 4c are treated together since they only differ in the degree by which the DAH is increased compared to the status quo. The butterfish specifications also impact the cap on the longfin squid fishery. Both 4b and 4c alternative propose a status quo cap, thus no change in non-target impacts related to butterfish's potentially limiting influence on the longfin squid fishery would be expected from 4b or 4c compared to the status quo - the cap is 3,884 mt in all cases. Recent non-target interactions from the longfin squid fishery have been described above in Section 6 and those would be expected to remain approximately the same, although changes in abundance/availability of squid can affect effort levels (see table 41).

All of the species that interact with the butterfish fishery would be expected to be negatively impacted to some degree by expansion of the butterfish fishery considered in 4b and 4c compared to the status quo or 4d. Impacts would be greater with 4c compared to 4b.

However, in previous years when the butterfish fishery operated there was no minimum mesh and the attitude toward discarding fishery-wide was different. It is also expected that the 3" minimum mesh proposed as part of the reestablishment of the butterfish fishery would minimize bycatch, and any observer data from trips targeting butterfish will be examined to determine if additional steps are needed in the future. In addition, since the effort that is expended toward butterfish is effort that may have been expended toward longfin squid fishing, and longfin squid fishing has fairly high incidental catch rates, there may be minimal overall change in impacts on effort and therefore minimal change to impacts on non-target species. Also, any of the increased butterfish landings levels considered in 4b and 4c may only allow 3-12 directed trips if trips with historical levels of catch are taken (see discussion of this in habitat impact section above for Alternative Set 4), further suggesting that overall impacts on non-target species should be negligible for the action alternatives 4b and 4c compared to the status quo, even if they are negative in direction.

4d – low alternative – Specify an ABC of 6,825 mt, ACT of 6,143 mt, DAH of 2,400 mt, and Cap of 2,913 mt.

Since the changes in the specifications from the status quo to 4d are small, and the specifications in 4d would not have been binding in recent years (for either butterfish DAH or the cap), impacts are likely to be negligible compared to the status quo. Since these specifications are lower than the status quo or 4b and 4c there theoretically could be some reduction in effort compared to the effort that could occur under the status quo, 4b, or 4c, but since the DAH or cap levels in 4d would not have been constraining

in recent years, overall impacts on non-target species should be negligible for the action alternative 4d compared to the status quo or other action alternatives, even if they are positive in direction.

Thus overall for Alternative Set 4, one would expect landings, and effort, to be lowest with 4d, then higher with 4a, 4b, and 4c in that order. Non-target species impacts track fishing effort, so non-target species impacts would be lowest with 4d, then higher with 4a, 4b, and 4c in that order.

Non-Target Species Impacts Summary

Most of the action alternatives considered in this document should have similar impacts relative to the status quo (detailed in Section 6.5). The RH/S cap action alternatives (1b-1d) may have positive impacts for non-target species, especially for river herrings and shads, and especially if a low cap alternative is selected. Increasing the longfin trip limit for *Illex* fishing (2b and 2c) could have minor negative impacts. Increasing the butterfish DAH (4b-4c) may increase non-target impacts, but the change from the status quo is likely negligible since the change in DAH and any possible effort changes are relatively small. Decreasing the butterfish DAH and butterfish cap (4d) may decrease non-target impacts, but the change from the status quo is likely negligible since the changes in DAH and cap are relatively small, and the amounts considered in 4d would not have been binding in recent years.

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7.6 Cumulative Impacts of Preferred Alternatives on Identified Valued Ecosystem Components

The impacts of the proposed specifications (preferred alternatives) for 2014 considered herein are expected to be positive since they are likely to provide positive socioeconomic benefits without inducing substantial negative impacts to the managed species, habitat, protected resources, or other non-target species. The proposed specifications are considered the most reasonable actions to achieve the FMP's conservation objectives while optimizing the outcomes for fishing communities given the conservation objectives, as per the objectives of the FMP, which are summarized in Section 4. The expected impacts of each alternative have been analyzed earlier in this section and are summarized in Tables 1 and 2 in the Executive Summary for the status quo and preferred alternatives.

Definition of Cumulative Effects

A cumulative impact analysis is required by the Council on Environmental Quality's regulation for implementation of NEPA. Cumulative effects are defined under NEPA as "The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other action (40 CFR section 1508.7)."

The cumulative impacts of past, present, and future Federal fishery management actions (including the specification recommendations in this document) should generally be positive. The mandates of the MSA as currently amended and of the NEPA require that management actions be taken only after consideration of impacts to the biological, physical, economic, and social dimensions of the human environment. Therefore, it is expected that under the current and proposed management regime, the long term cumulative impacts will contribute toward improving the human environment.

Temporal Scope

The temporal scope of this analysis is primarily focused on actions that have taken place since 1976, when these fisheries began to be managed under the MSA. For endangered and other protected species, the context is largely focused on the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. In terms of future actions, the analysis considers the period between the expected effective date of these specifications (January 1, 2014) and Dec 31, 2018, a period of five years. The temporal scope of this analysis does not extend beyond 2018 because the FMP and the issues facing these fisheries may change in ways that can't be effectively predicted.

Geographic Scope

The geographic scope of the analysis of impacts to fish species and habitat for this action is the range of the fisheries in the Western Atlantic Ocean, as described in the Affected Environment and Environmental Consequences sections of the document. For endangered and protected species the geographic range is the total range of each species. The geographic range for socioeconomic impacts is defined as those fishing communities bordering the range of the fisheries for mackerel, longfin squid and *Illex* squid and butterfish which occur primarily from the U.S.- Canada border to Cape Hatteras, although the management unit includes all the coastal states from Maine to Florida.

Summary of the Past, Present and Reasonably Foreseeable Future Actions

The earliest management actions implemented under this FMP involved the sequential phasing out of foreign fishing for these species in US waters and the gradual development of domestic fishing fleet. All MSB species are considered to be fully utilized by the US domestic fishery to the extent that sufficient availability would allow full harvest of the DAH/landings quota. More recent actions have focused on reducing bycatch and habitat impacts.

Past actions which had a major impact on the fishery included: the implementation of a limited access program in Amendment 5 to control capacity in the squid and butterfish fisheries; revision of overfishing definitions in Amendment 6; modification of vessel upgrade rules in Amendment 7; and implementation of overfishing and rebuilding control rules and other measures in Amendment 8. Amendment 9 allowed multi-year specifications, extended the moratorium on entry into the *Illex* fishery without a sunset provision; adopted biological reference points recommended by the SARC 34 (2002) for longfin squid; designated EFH for longfin squid eggs, and prohibited bottom trawling by MSB-permitted vessels in Lydonia and Oceanographer Canyons. Amendment 10's measures included increasing the longfin squid minimum mesh to 2 1/8 inches in Trimesters 1 and 3 and implementing a butterfish mortality cap in the longfin squid fishery. Amendment 11 implemented mackerel limited access, a recreational-commercial mackerel allocation, and EFH updates. Amendment 12 implemented a Standardized Bycatch Reporting Methodology that has since been vacated by court order and will be revisited in a new upcoming amendment. Amendment 13 to the MSB FMP implemented Annual Catch Limit and Accountability Measures.

In the near future Amendment 14 is likely to result in additional mitigation of non-target catch of river herring and shads. Amendment 14 will both increase and improve monitoring (vessel, dealer, and observer) of the mackerel and longfin squid fisheries and implement a cap catch of river herrings and shads in the mackerel fishery in 2014. Monitoring improvements include minimization of unobserved catch, observer facilitation and assistance, weekly vessel trip reporting, additional trip notification, and electronic vessel monitoring systems and reporting.

Annual specifications actions in future years should maintain the benefits as described above. Other actions expected before 2018 include Amendment 15, which will protect deep water corals, Framework 8, which will optimize butterfish quota management, Framework 9, which will improve observer operations by minimizing slippage (unobserved discards), and an omnibus Amendment to increase observer coverage through industry funding.

Amendment 5 to the Atlantic Herring FMP will institute similar river herring measures for the Atlantic Herring fishery (many MSB-permitted vessels have Atlantic herring permits as well) and implementation should be in parallel to Amendment 14.

Regarding protected resources, a take reduction strategy for long-finned pilot whales (*Globicephala melas*), short-finned pilot whales (*Globicephala macrorhynchus*), white-sided dolphins (*Lagenorhynchus acutus*), and common dolphins (*Delphinus delphis*) has been developed and is described in Section 6.

Overall all of the past fishery actions described in the above section have served to reduce effort or the impacts of effort through access limitations, upgrade restrictions, area and gear restrictions, EFH designations, monitoring, and accountability. These reductions have likely benefitted the managed

species, habitat, protected resources, and non-target species. By ensuring the continued productivity of the managed resources, the human communities that benefit from catching the managed resources have also benefited in the long term though at times quota reductions may have caused short-term economic dislocations.

In addition to the direct effects on the environment from fishing, the cumulative effects to the physical and biological dimensions of the environment may also come from non-fishing activities. Non-fishing activities, in this sense, relate to habitat loss from human interaction and alteration or natural disturbances. These activities are widespread and can have localized impacts to habitat such as accretion of sediments from at-sea disposal areas, oil and mineral resource exploration, aquaculture, construction of at-sea wind farms, bulk transportation of petrochemicals and significant storm events. In addition to guidelines mandated by the MSFMCA, NMFS reviews some of these types of effects during the review process required by Section 404 of the Clean water Act and Section 10 of the Rivers and Harbors Act for certain activities that are regulated by Federal, state, and local authority. The jurisdiction of these activities is in "waters of the United States" and includes both riverine and marine habitats.

Cumulative Effects Analysis

The cumulative impacts of this FMP were last fully addressed in final form by the EIS for Amendment 14 (http://www.nero.noaa.gov/regs/2013/August/12smba14pr.html). All four species in the management unit are managed primarily via annual specifications to control fishing mortality so the operation of the fishery is also reviewed annually. As noted above, the cumulative impact of this FMP and annual specification process has been positive since its implementation after passage of the Magnuson Act for both the resources and communities that depend on them. Limited access and control of fishing effort through implementation of the annual specifications have had a positive impact on target and non-target species since the current domestic fishery is being prosecuted at lower levels of fishing effort compared to the historical foreign fishery. The foreign fishery was also known to take significant numbers of marine mammals including common dolphin, white sided dolphin, and pilot whales.

The Council continues to manage these resources in accordance with the National Standards required under the Magnuson-Stevens Act. First and foremost the Council has strived to meet the obligations of National Standard 1 by adopting and implementing conservation and management measures that prevent overfishing, while achieving, on a continuing basis, the optimum yield for the four species and the United States fishing industry. The Council uses the best scientific information available (National Standard 2) and manages these resources throughout their range (National Standard 3). The management measures do not discriminate between residents of different states (National Standard 4), and they do not have economic allocation as its sole purpose (National Standard 5). The measures account for variations in fisheries (National Standard 6), avoid unnecessary duplication (National Standard 7), they take into account fishing communities (National Standard 8), address bycatch in these fisheries (National Standard 9) and promote safety at sea (National Standard 10). By continuing to meet the National Standards requirements of the Magnuson-Stevens Act through future FMP amendments and actions, the Council should insure that cumulative impacts of these actions will remain positive. The cumulative effects of the proposed specifications will be examined for the following five valued economic components: target/managed species, habitat, protected species, communities, and non-target species.

7.6.1. Target Fisheries and Managed Resources

First and foremost, the Council has met the obligations of National Standard 1 by adopting and implementing conservation and management measures that have prevented overfishing, while achieving, on a continuing basis, the optimum yield for the four species and the United States fishing industry. Mackerel were overfished prior to US management under the Magnuson Act and then were subsequently rebuilt under the FMP and subsequent Amendments. While the current status based on a 2010 TRAC assessment is unknown, the stock is likely in better shape compared to if no management had taken place. Longfin squid were considered overfished in 2000 but remedial action by the Council in subsequent years (i.e., reduced specifications) resulted in stock rebuilding to the point that the species in no longer considered overfished. *Illex* has never been designated as overfished since passage of the Sustainable Fisheries Act. In the case of butterfish, the current status is unknown and the Council is maintaining the butterfish cap for the longfin squid fishery to help limit butterfish mortality at SSC-approved levels that should avoid overfishing.

The most obvious and immediate impact on the stocks managed under this FMP occurs as a result of fishing mortality. The Council manages federally permitted vessels which fish for these four species throughout their range in both Federal and state waters. Fishing mortality from all fishing activities that catch these species is controlled and accounted for by the specifications and incorporated into stock assessments. In addition to mortality on these stocks due to fishing, there are other indirect effects from non-fishing anthropogenic activities, but these are generally not quantifiable at present. Nonetheless, since these species occur over wide areas of the mid and north Atlantic Ocean and inhabit both inshore and offshore pelagic waters, it is unlikely that any indirect anthropogenic activity currently substantially impacts these populations, especially in comparison to the direct effects on these stocks as a result of fishing.

The specifications proposed under the preferred alternative for each species were developed to achieve the primary goal of the FMP and Sustainable Fisheries Act which is to prevent overfishing. They are also intended to provide for the greatest overall benefit to the nation (i.e., achieve optimum yield). These measures in conjunction with previous actions and any future actions should continue to allow the Council to continue to manage these resources such that the objectives of the MSA continue to be met and therefore no significant cumulative effects to the target fisheries are expected.

7.6.2 Essential Fish Habitat (EFH)

The 2002 final rule for EFH requires that FMPs minimize to the extent practicable adverse effects on EFH caused by fishing (section 600.815 (a) (2)). Pursuant to the final EFH regulations (50 CFR 600.815(a)(2)), FMPs must contain an evaluation of the potential adverse effects of fishing on EFH designated under the FMP, including effects of each fishing activity regulated under the FMP or other Federal FMPs. The evaluation should consider the effects of each fishing activity on each type of habitat found within EFH. FMPs must describe each fishing activity, review and discuss all available relevant information (such as information regarding the intensity, extent, and frequency of any adverse effect on EFH: the type of habitat within EFH that may be affected adversely; and the habitat functions that may be disturbed), and provide conclusions regarding whether and how each fishing activity adversely affects EFH. The evaluation should also consider the cumulative effects of multiple fishing activities on EFH

The mackerel fishery primarily uses mid-water trawls. Bottom otter trawls are the principal gear used in the squid and butterfish fisheries. In general, bottom tending mobile gears have the potential to reduce habitat complexity and change benthic communities. Available research indicates that the effects of mobile gear are cumulative and are a function of the frequency and intensity with which an area is fished, the complexity of the benthic habitat (structure), energy of the environment (high energy and variable or low energy and stable), and ecology of the community (long-lived versus short lived). The extent of an adverse impact on habitat requires high resolution data on the location of fishing effort by gear and the location of specific seafloor habitats.

Stevenson *et al.* (2004) performed an evaluation of the potential impacts of otter trawls and susceptible species and life stages are described in Section 6.3. The Council analyzed MSB gear impacts on EFH in Amendment 9, which also included measures which address gear impacts on EFH. To reduce MSB gear impacts on EFH, Amendment 9 prohibited bottom trawling by MSB-permitted vessels in Lydonia and Oceanographer Canyons. Amendment 1 to the Tilefish FMP created closures in these canyons as well as Veatches and Norfolk canyons for bottom trawling. All EFH designations were updated in Amendment 11 and the new designations will be used in future evaluations. However since the EFH for most MSB species is the water column, MSB species are generally not susceptible to impacts from the MSB fisheries. Overall, impacts on EFH have been reduced and will continue to be analyzed to see if additional minimization is practicable in the future. As noted above, none of the management measures for 2014 under the preferred alternatives are expected to result in substantial changes to levels of effort relative to the status quo.

Johnson et al 2008 (available at http://www.nefsc.noaa.gov/publications/tm/tm209/index.html) suggest that for non-fishing impacts, given the wide distribution of the MSB species and their use of EFH (the water column), minor overall negative effects to their habitat are anticipated since the affected areas are localized to specific project sites, which involve a small percentage of the fish populations and their habitat.

7.6.3 Protected Species

There are numerous species which inhabit the environment within the management unit of this FMP that are afforded protection under the ESA of 1973 and/or the Marine Mammal Protection MMPA. Eleven are classified as endangered or threatened under the ESA, while others are protected by the provisions of the MMPA. The species protected either by the ESA, the MMPA, or the Migratory Bird Act of 1918, that be found in the environment utilized by mackerel, squid and butterfish fisheries are listed in section 6.4.

As noted above, none of the management measures for 2014 under the preferred alternatives are expected to result in substantial changes to levels of effort relative to the status quo. Prior to the passage of the Magnuson Act and development of this FMP, the foreign prosecution of these fisheries occurred at much higher levels of fishing effort and were likely a major source of mortality for a number of marine mammal stocks, turtles, and sturgeon. The elimination of these fisheries and subsequent controlled development of the domestic fisheries have resulted in lower fishing effort levels. The cumulative effect of the proposed measures for 2014 in conjunction with past and future management actions under the FMP and take reduction measures developed under the MMPA should continue to reduce the impact of these fisheries on the protected species listed in section 6.4.

7.6.4 Human Communities

National Standard 8 requires that management measures take into account fishing communities. Communities from Maine to North Carolina are involved in the harvesting of mackerel, squid and butterfish. Through implementation of the FMP for these species the Council seeks to achieve the primary objective of the Magnuson-Stevens Act which is to achieve optimum yield from these fisheries.

The first cumulative human community effect of the FMP has been to guide the development of the domestic harvest and processing fishery infrastructure. Part of this fishery rationalization process included the development of limited access programs to control capitalization while maintaining harvests at levels that are sustainable. In addition, by meeting the National Standards prescribed in the MSA, the Council has strived to meet one of the primary objectives of the act - to achieve optimum yield in each fishery. The proposed specifications for 2014, in conjunction with the past and future actions described above, should have positive cumulative impacts for the communities which depend on these resources by maintaining stock sizes that provide for optimal sustainable harvests.

7.6.5 Non-target Species

National Standard 9 requires Councils to consider the bycatch effects of existing and planned conservation and management measures. The term "bycatch" means fish that are harvested in a fishery, but that are not sold or kept for personal use. Bycatch includes the discard of whole fish at sea or elsewhere, including economic discards and regulatory discards, and fishing mortality due to an encounter with fishing gear that does not result in capture of fish (i.e., unobserved fishing mortality). Bycatch does not include any fish that legally are retained in a fishery and kept for personal, tribal, or cultural use, or that enter commerce through sale, barter, or trade.

None of the management measures recommended by the Council for 2014 under the preferred alternatives are expected to substantially promote or result in increased overall levels of bycatch relative to the status quo because none are expected to substantially increase effort. Past measures implemented under this FMP which help to control or reduce discards of non-target species in these fisheries include 1) limited entry and specifications which are intended to control or reduce fishing effort, 2) incidental catch allowances, and 3) minimum mesh requirements. Other FMPs have also regulated MSB fishing to minimize bycatch as well, such as the Scup Gear Restricted Areas implemented through its FMP. The measures proposed under the preferred alternative for each species, in conjunction with these past actions, should maintain reductions or further reduce historical levels of bycatch and discards in these fisheries. Related to the increase in the butterfish quota for 2014, maintenance of a 3" mesh for directed butterfish fishing, coupled with the fact that the increased quota may only translate into roughly 3 directed trips, means that overall bycatch should continue to be minimized bycatch to the extent practicable. Also, the primary historical butterfish producer might target longfin squid at the same time it targets butterfish, which means overall non-target impacts may be minimal given the relatively high incidental catch rates currently in the longfin squid fishery.

The measure (2b) to increase the retention limit of longfin squid for *Illex* fishing during longfin squid directed fishery closures to 15,000 pounds may reduce regulatory discards on longfin squid.

In addition to mortality on these stocks due to fishing, there are other indirect effects from non-fishing anthropogenic activities in the Atlantic Ocean, but these are generally not quantifiable at present. Nonetheless, since these species occur over wide areas of the mid and north Atlantic Ocean and inhabit both inshore and offshore pelagic waters, it is unlikely that any indirect anthropogenic activity currently substantially impacts these populations, especially in comparison to the direct effects on these populations as a result of fishing.

In the near future Amendments 14 is likely to result in additional monitoring of and mitigation of non-target catch of river herring and shads.

7.7 Summary of cumulative impacts

The impacts of the preferred alternatives on the biological, physical, and human environment are described in section 7. The overall interactions of improvements in the efficiency of the fisheries are expected to generate positive impacts. These impacts will be felt most strongly in the social and economic dimension of the environment. These benefits are also summarized in the Regulatory Impact Review and Initial Regulatory Flexibility Analysis, which are appended to this document. Indirect benefits of the preferred alternatives are likely to affect consumers and in areas of the economic and social environment that interact in various ways with these fisheries. The proposed actions, together with past and future actions are not expected to result in significant cumulative impacts on the biological, physical, and human components of the environment. As long as management continues to prevent overfishing and rebuild overfished stocks, the fisheries and their associated communities should continue to benefit. As noted above, the historical development of the FMP resulted in a number of actions which have impacted these fisheries and other valued ecosystem components. The cumulative effects of past actions in conjunction with the proposed measures for 2014 and possible future actions are discussed above. Within the construct of that analysis, the Council has concluded that no significant particular or cumulative impacts will result from the specifications proposed for 2014.

8.0 WHAT LAWS APPLY TO THE ACTIONS CONSIDERED IN THIS DOCUMENT?

8.1 Magnuson-Stevens Fishery Conservation and Management Act

8.1.1 NATIONAL STANDARDS

Section 301 of the Magnuson-Stevens Fishery Conservation and Management Act requires that fishery management plans contain conservation and management measures that are consistent with the ten National Standards:

In General. – Any fishery management plan prepared, and any regulation promulgated to implement any such plan, pursuant to this title shall be consistent with the…national standards for fishery conservation and management.

(1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

The measures proposed via this document are designed to avoid acceptable biological catch overages (i.e. avoid overfishing) while also allowing the fishery to achieve the specified quotas, i.e. optimum yield.

(2) Conservation and management measures shall be based upon the best scientific information available.

The data sources considered and evaluated during the development of this action include, but are not limited to: permit data, landings data from vessel trip reports, information from resource trawl surveys, sea sampling (observer) data, data from the dealer weighout purchase reports, peer-reviewed assessments and original literature, and descriptive information provided by fishery participants and the public. To the best of the Council's knowledge these data sources constitute the best scientific information available. All analyses based on these data have been reviewed by National Marine Fisheries Service and the public.

(3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

The fishery management plan addresses management of the mackerel, squid, and butterfish stocks throughout the range of the species in U.S. waters, in accordance with the jurisdiction of U.S. law.

(4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The proposed management measures are not expected to discriminate between residents of different States. This action does not allocate or assign fishing privileges among various fishermen.

(5) Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

The proposed measures should not impact the efficiency of utilization of fishery resources. They are designed to continue the effective management and utilization of mackerel, squid, and butterfish resources.

(6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

Changes in fisheries occur continuously, both as the result of human activity (for example, new technologies or shifting market demand) and natural variation (for example, oceanographic perturbations). Recent stock assessments have suggested that the mackerel, squid, and butterfish stocks are all likely particularly sensitive to environmental variables. In order to provide the greatest flexibility possible for future management decisions, the fishery management plan includes a Framework adjustment mechanism with an extensive list of possible Framework adjustment measures that can be used to quickly adjust the plan as conditions in the fishery change. The measures in this document to address longfin squid catch during *Illex* fishing also should reduce circumstances of regulatory discarding.

(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

As always, the Council considered the costs and benefits associated with the management measures proposed in the action when developing this action. This action should not create any duplications related to managing the mackerel, squid, and butterfish resources.

(8) Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

The human community impacts of the action are described above in Section 7 and predicted to be positive. While the river herring and shad cap may limit mackerel fishing in the short term, the Council determined that the potential benefits for river herring and shad conservation warranted such limits. Also, if the mackerel fishery can achieve a relatively low river herring/shad interaction rate they will still be able to catch their full quota.

(9) Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

The Magnuson-Stevens Act defines "bycatch" as fish that are harvested in a fishery, but are not retained (sold, transferred, or kept for personal use), including economic discards and regulatory discards. Incidentally landed catch are fish, other than the target species, that are harvested while fishing for a target species and retained and/or sold. The river herring and shad cap may reduce interactions with these species in the mackerel fishery, and therefore discards of these species (though most are usually retained when caught). The modification of longfin squid trip limits during *Illex* fishing should reduce regulatory discarding. The modification of the Phase 3 butterfish trip limit could also allow fishermen to retain slightly more of small catches of butterfish once the primary butterfish fisheries are closed, also reducing regulatory discarding.

(10) Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

Fishing is a dangerous occupation; participants must constantly balance the risks imposed by weather against the economic benefits. According to the National Standard guidelines, the safety of the fishing vessel and the protection from injury of persons aboard the vessel are considered the same as "safety of human life at sea. The safety of a vessel and the people aboard is ultimately the responsibility of the master of that vessel. Each master makes many decisions about vessel maintenance and loading and about the capabilities of the vessel and crew to operate safely in a variety of weather and sea conditions. This national standard does not replace the judgment or relieve the responsibility of the vessel master related to vessel safety. No measures in this action are expected to impact safety at sea.

8.1.2 Other Required Provisions of the Magnuson-Stevens Act

Section 303a of the Magnuson-Stevens Act contains 15 additional required provisions for Fishery Management Plans. Such provisions are detailed in the Environmental Impact Statement to Amendment 14, which is available at: http://www.nero.noaa.gov/regs/2013/August/12smba14pr.html. In general, these provisions detail the measures and monitoring required for federally managed species in order to ensure successful conservation. Given the limited scope of this action, there should be no significant impacts related to such requirements.

8.1.3 DISCRETIONARY PROVISIONS OF THE MAGNUSON-STEVENS ACT

Section 303b of the Magnuson-Stevens Act contains 14 additional discretionary provisions for Fishery Management Plans. They may be read on pages of 59 and 60 of National Marine Fisheries Service's redline version of the Magnuson-Stevens Act at: http://www.nmfs.noaa.gov/msa2007/MSA_Amended%20by%20Magnuson-Stevens%20Reauthorization%20Act%20%281-31-07%20draft%29.pdf. Given the limited scope of this action, there are no significant impacts related to such provisions except provision 12: "include management measures in the plan to conserve target and non-target species and habitats, considering the variety of ecological factors affecting fishery populations." The river herring and shad cap is rooted in the mandate to reduce bycatch as well as this discretionary provision since river herring and shad are not targeted by the mackerel fishery.

8.1.4 ESSENTIAL FISH HABITAT ASSESSMENT

The specifications under the preferred alternatives proposed in this action are not expected to result in substantial changes in effort. Therefore, the Council concluded in section 7 of this document that the proposed MSB specifications will have no adverse impacts on EFH other than those that may currently exist. Thus no mitigation is necessary. The adverse impacts of bottom trawls used in MSB fisheries on other managed species (not MSB), which were determined to be more than minimal and not temporary in Amendment 9, were minimized to the extent practicable by the Lydonia and Oceanographer canyon closures to squid fishing. In addition, Amendment 1 to the Tilefish FMP closed those canyons plus Veatch's and Norfolk Canyons to all bottom trawling. Therefore, the adverse habitat impacts of MSB fisheries "continue to be minimized" by the canyon closures. Amendment 11 revised all of the MSB EFH designations and EFH impacts will continue to be monitored and addressed as appropriate.

8.2 NEPA

8.2.1 Finding of No Significant Impact (FONSI)

National Oceanic and Atmospheric Administration Administrative Order 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality regulations at 40 C.F.R. '1508.27 state that the significance of an action should be analyzed both in terms of context and intensity. Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the Administrative Order 216-6 criteria and Council on Environmental Quality's context and intensity criteria. These include:

1) *Can the proposed action reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action*?

None of the proposed specifications are expected to jeopardize the sustainability of any target species affected by the action (see section 7 of this document). The proposed quota specifications under the preferred alternatives for each species are consistent with the FMP and best available scientific information. As such, the proposed action is expected to ensure the long-term sustainability of harvests from the MSB stocks.

2) *Can the proposed action reasonably be expected to jeopardize the sustainability of any non-target species*?

The proposed action is not expected to jeopardize the sustainability of any non-target species (see section 7 of this document) because the proposed specifications are not expected to result in substantial increases in fishing effort. In addition, none of the measures are expected to substantially alter fishing methods or the temporal and/or spatial distribution of fishing activities. Therefore, none of the proposed actions for 2014 are expected to jeopardize the sustainability of non-target species. The butterfish cap, which began in 2011, should continue to reduce bycatch of butterfish and may reduce bycatch of other species if the cap closes the longfin squid fishery earlier than would have otherwise occurred or the fishery proactively avoids bycatch. The same is likely to be true related to the river herring/shad (RH/S) cap specifications that are being set in this document. There should be specific benefits to RH/S and general bycatch benefits if mackerel closes because of the cap. The rejuvenation of the butterfish fishery will continue to be examined to see if it causes any issues with non-target species that require mitigation.

3) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or EFH as defined under the Magnuson-Stevens Act and identified in FMPs?

The proposed action is not expected to cause damage to the ocean, coastal habitats, and/or EFH as defined under the Magnuson-Stevens Act and identified in the FMP (see Section 7). In general, bottom-tending mobile gear, primarily otter trawls, which are used to harvest mackerel, squid, and butterfish, have the potential to adversely affect EFH for the benthic lifestages of a number of species in the Northeast region that are managed by other FMPs. However, because none of the management measures proposed in this action for 2014 should cause any substantial increase in fishing effort

relative to status quo, they are not expected to have any substantial negative impact on EFH or on coastal and ocean habitats relative to the 2013 specifications.

4) Can the proposed action reasonably be expected to have a substantial adverse impact on public health or safety?

None of the measures substantially alter the manner in which the industry conducts fishing activities for the target species. Therefore, the proposed actions in these fisheries are not expected to adversely impact public health or safety.

5) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?

The mackerel, longfin squid, *Illex* and butterfish fisheries are known to interact with common and white sided dolphins and pilot whales. Fishing effort is not expected to substantially increase in magnitude under the proposed specifications. In addition, none of the proposed measures are expected to substantially alter fishing methods, activities, or the spatial and/or temporal distribution of fishing effort. Therefore, this action is not expected to have increased negative effects on common and white sided dolphin and pilot whales. The mackerel, *Illex* and butterfish fisheries are not known to substantively interact with any endangered or threatened turtle species or their critical habitat. The longfin squid fishery has been known to have interactions with loggerhead, green, and leatherback sea turtles as discussed in section 6.4. The proposed action is not expected to substantially increase fishing effort or substantially alter fishing patterns in a manner that would adversely affect these endangered species of sea turtles.

NMFS has reinitiated consultation on seven fisheries, including the MSB FMP. In a memo dated August 28, 2012, NMFS determined that allowing these fisheries to continue during the re-initiation period will not violate ESA sections 7(a)(2) and 7(d). Therefore, the continued operation of the MSB fisheries is not likely to jeopardize the continued existence of any Atlantic sturgeon DPS. NMFS will implement any appropriate measures outlined in the Biological Opinion to mitigate harm to Atlantic sturgeon.

6) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

These fisheries are prosecuted using bottom otter trawls, which have the potential to impact bottom habitats. In addition, a number of non-target species are taken incidentally to the prosecution of these fisheries. However, fishing effort is not expected to substantially increase in magnitude under the proposed specifications (see section 7.0 of this document). In addition, none of the proposed specifications are expected to substantially alter fishing methods, activities or the spatial and/or temporal distribution of fishing effort. Therefore, the proposed action is not expected to have a substantial impact on biodiversity and ecosystem function within the affected area.

7) Are significant social or economic impacts interrelated with natural or physical environmental effects?

The action proposed is largely administrative in nature and addresses the mackerel, squid, and butterfish fishery specifications process, which was established in the FMP and modified in various amendments, frameworks, and specifications. There are no significant social or economic impacts interrelated with natural or physical environmental effects expected from implementation of this action. A complete discussion of the potential impacts of the proposed specifications and management measures is provided in Section 7 of this document.

8) Are the effects on the quality of the human environment likely to be highly controversial?

The proposed action is based on measures contained in the FMP which have generally been in place for many years. In addition, the scientific information upon which the annual quotas for managed species are based has been reviewed by the Council's SSC and is the most recent information available. As a result of these facts, the specifications in 2014 are not expected to be controversial. The cap for RH/S was analyzed in Amendment 14 and additional details on the development of the RH/S cap may be found there.

9) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?

The action proposed is largely administrative in nature and addresses the mackerel, squid, and butterfish fishery specifications process, which was established in the FMP and modified in various amendments, frameworks, and specifications. Other types of commercial fishing already occur in this area, and although it is possible that historic or cultural resources such as shipwrecks could be present, vessels try to avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. Therefore, it is not likely that the preferred alternative would result in substantial impacts to unique areas.

10) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

While there is always a degree of uncertainty in the year to year performance of the relevant fisheries, the proposed actions are not expected to substantially increase effort or to substantially alter fishing methods and activities. As a result, the effects on the human environment of the proposed specifications are not highly uncertain nor do they involve unique or uncertain risks (see section 7.0 of this document).

11) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

The impacts of the preferred alternatives on the biological, physical, and human environment are described in section 7.0. The overall interaction of the proposed action with other actions are expected to generate positive impacts, but are not expected to result in significant cumulative impacts on the biological, physical, and human components of the environment.

12) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

The action proposed is largely administrative in nature and addresses the mackerel, squid, and butterfish fishery specifications process, which was established in the FMP and modified in various amendments, frameworks, and specifications. Although there are shipwrecks present in the area where fishing occurs, including some registered on the National Register of Historic Places, vessels typically avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. Therefore, it is not likely that the preferred alternative would adversely affect the historic resources listed above.

13) Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

There is no evidence or indication that these fisheries have ever resulted or would ever result in the introduction or spread of nonindigenous species.

14) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

The proposed action has been proposed and evaluated consistent with prior year's specification setting processes and/or amendments and therefore is neither likely to establish a precedent for future actions with significant effects nor to represent a decision in principle about a future consideration.

15) Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

Fishing effort is not expected to substantially increase in magnitude under the proposed action (see section 7.0 of this document). In addition, none of the proposed specifications are expected to substantially alter fishing methods, activities, or the spatial and/or temporal distribution of fishing effort. Thus, it is not expected that they would threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment. The proposed measures have been found to be consistent with other applicable laws as described in this Section.

16) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

Fishing effort is not expected to substantially increase in magnitude under the proposed action (see section 7.0 of this document). In addition, none of the proposed specifications are expected to substantially alter fishing methods, activities or the spatial and/or temporal distribution of fishing effort. Therefore the proposed action is unlikely to result in cumulative adverse effects (including any that could have a substantial effect on the target species or non-target species).

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for 2014 mackerel, squid and butterfish fisheries, it is hereby determined that the proposed specifications for 2014 will not significantly impact the quality of the human environment as described in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not necessary.

_____ _____

Northeast Regional Administrator, NOAA Date

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8.3 Marine Mammal Protection Act

The various species which inhabit the management unit of this FMP that are afforded protection under the Marine Mammal Protection Act of 1972 (MMPA) are described in Section 6.4. Four species of marine mammals are known to interact with the mackerel, squid and butterfish fisheries - long and short finned pilot whales, common dolphin and white sided dolphin. None of the specifications are expected to significantly alter fishing methods or activities or result in substantially increased effort. The Council has reviewed the impacts of the proposed specifications for the 2014 mackerel, squid and butterfish fisheries on marine mammals and concluded that the management actions proposed are consistent with the provisions of the MMPA and would not alter existing measures to protect the species likely to inhabit the management units of the subject fisheries. For further information on the potential impacts of the fishery and the proposed management action, see Sections 6 and 7 of this Environmental Assessment.

8.4 Endangered Species Act

Section 7 of the ESA requires Federal agencies conducting, authorizing, or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The Council has concluded that the proposed 2014 specifications for mackerel, *Illex* and butterfish and the prosecution of the associated fisheries are not likely to result in jeopardy to any ESA-listed species under NOAA Fisheries Service jurisdiction, or alter or modify any critical habitat, based on the analysis in this document. For further information on the potential impacts of the fisheries and the proposed management action, see Section 6.4 of this document.

Formal consultation on the MSB fishery was last completed on October 29, 2010. The October 29, 2010, Biological Opinion concluded that the operation of the MSB fishery is not likely to jeopardize the continued existence of listed species. An ESA Section 7 consultation for 2012 MSB Specifications was completed on September 9, 2011. The consultation concluded that the proposed specification measures do not constitute a modification to the operations of the MSB fisheries under the FMP that would cause an effect to ESA-listed species or critical habitat not considered in the October 29, 2010 Biological Opinion.

NMFS is finalizing a biological opinion related to the recent sturgeon listing to determine what fishery restrictions might be necessary for Council fisheries, but recent increases in the estimated number of adult sturgeon suggest changes to the MSB fishery as a result of sturgeon's ESA listing are likely unwarranted. The Council has also established a Sturgeon Advisory Panel to help guide its efforts and will consider appropriate measures once the biological opinion is finalized. Because estimated encounters and expected mortalities are lower in recent years than have been estimated in the past, and because small-mesh gear typically accounts for a small proportion of encounters, it is unlikely that the implementation of 2014 Specifications for the MSB fisheries would result in significant impacts to any DPS of Atlantic sturgeon.

The effects of the MSB fishery on loggerhead sea turtles were assessed in the October 2010 Biological Opinion on the Atlantic Mackerel, Squid and Butterfish FMP. A revised listing for loggerhead sea turtles, published on September 16, 2011, establishes nine DPSs, four of which are listed as threatened and five of which are listed as endangered. The October 2010 Biological Opinion concluded that the fishery may affect, but was not likely to jeopardize, loggerhead sea turtles. In reaching that

conclusion, the Biological Opinion considered the effect of the estimated take on nesting beach aggregations and ultimately to the global species as listed. The analysis contained in the 2010 Biological Opinion was conducted at the level of the global species, and was conducted for a species listed as threatened. Only the Northwest Atlantic DPS is likely to be affected by the MSB fishery and is listed as threatened. The effects analysis was conducted by examining the estimated number of takes against what is known about the biological status of loggerhead sea turtles and did not explicitly include any specific variable that would be affected by the listing status *(e.g.,* threatened or endangered). Since the 2010 Opinion considered effects at the nesting beach aggregation level first and then worked up to consider effects at the species level, an analysis considering effects at the DPS rather than species level and on an endangered rather than threatened species would not change the jeopardy conclusion of the Opinion.

8.5 Administrative Procedures Act

Section 553 of the Administrative Procedure Act establishes procedural requirements applicable to informal rulemaking by Federal agencies. The purpose of these requirements is to ensure public access to the Federal rulemaking process, and to give the public adequate notice and opportunity for comment. At this time, the Council is not requesting any abridgement of the rulemaking process for this action.

8.6 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act is to control and, to the extent possible, minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. This action does not propose to modify any existing collections, or to add any new collections; therefore, no review under the Paperwork Reduction Act is necessary.

8.7 Coastal Zone Management Act

Section 307(c)(1) of the Federal Coastal Zone Management Act of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. Pursuant to the Coastal Zone Management Act regulations at 15 CFR 930.35, a negative determination may be made if there are no coastal effects and the subject action: (1) Is identified by a state agency on its list, as described in ' 930.34(b), or through case-by-case monitoring of unlisted activities; or (2) which is the same as or is similar to activities for which consistency determinations have been prepared in the past; or (3) for which the Federal agency undertook a thorough consistency assessment and developed initial findings on the coastal effects of the activity. Accordingly, NMFS has determined that this action would have no effect on any coastal use or resources of any state. Letters documenting the NMFS negative determination, along with this document, were sent to the coastal zone management program offices of the states of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida. A list of the specific state contacts and a copy of the letters are available upon request.

8.8 Section 515 (Data Quality Act)

Pursuant to NOAA guidelines implementing section 515 of Public Law 106-554 (the Data Quality Act), all information products released to the public must first undergo a Pre-Dissemination Review to ensure and maximize the quality, objectivity, utility, and integrity of the information (including statistical information) disseminated by or for Federal agencies. The following section addresses these requirements.

Utility

The information presented in this document should be helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the proposed action, the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the proposed action is included so that intended users may have a full understanding of the proposed action and its implications.

Until a proposed rule is prepared and published, this document is the principal means by which the information contained herein is available to the public. The information provided in this document is based on the most recent available information from the relevant data sources. The development of this document and the decisions made by the Council to propose this action are the result of a multi-stage public process. Thus, the information pertaining to management measures contained in this document has been improved based on comments from the public, the fishing industry, members of the Council, and NOAA Fisheries Service.

The Federal Register notice that announces the proposed rule and the final rule and implementing regulations will be made available in printed publication, on the website for the Northeast Regional Office, and through the Regulations.gov website. The Federal Register documents will provide metric conversions for all measurements.

Integrity

Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NOAA Fisheries Service adheres to the standards set out in Appendix III, ASecurity of Automated Information Resources,@ of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential information (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

Objectivity

For purposes of the Pre-Dissemination Review, this document is considered to be a Natural Resource Plan. Accordingly, the document adheres to the published standards of the Magnuson-Stevens Act; the Operational Guidelines, FMP Process; the EFH Guidelines; the National Standard Guidelines; and

NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act.

This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Stock status (including estimates of biomass and fishing mortality) reported in this product are based on either assessments subject to peer-review through the Stock Assessment Review Committee or on updates of those assessments prepared by scientists of the Northeast Fisheries Science Center. Landing and revenue information is based on information collected through the Vessel Trip Report and Commercial Dealer databases. Information on catch composition, by tow, is based on reports collected by the NOAA Fisheries Service observer program and incorporated into the sea sampling or observer database systems. These reports are developed using an approved, scientifically valid sampling process. In addition to these sources, additional information is presented that has been accepted and published in peer-reviewed journals or by scientific organizations. Original analyses in this document were prepared using data from accepted sources, and the analyses have been reviewed by members of the Mackerel, Squid and Butterfish Monitoring Committee or other NMFS staff with expertise on the subject matter.

Despite current data limitations, the conservation and management measures proposed for this action were selected based upon the best scientific information available. The analyses conducted in support of the proposed action were conducted using information from the most recent complete calendar years, generally through 2012 except as noted. The data used in the analyses provide the best available information on the number of seafood dealers operating in the northeast, the number, amount, and value of fish purchases made by these dealers, the number of reports made annually by these dealers, and the types of permits held by these dealers. Specialists (including professional members of plan development teams, technical teams, committees, and Council staff) who worked with these data are familiar with the most current analytical techniques and with the available data and information relevant to these fisheries.

The policy choices are clearly articulated in section 5 of this document as well as the management alternatives considered in this action. The supporting science and analyses, upon which the policy choices are based, are described in section 7 of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency.

The review process used in preparation of this document involves the responsible Council, the Northeast Fisheries Science Center, the Northeast Regional Office, and NOAA Fisheries Service Headquarters. The Center=s technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, demersal resources, population biology, and the social sciences. The Council review process involves public meetings at which affected stakeholders have opportunity to provide comments on the document. Review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of the action proposed in this document and clearance of any rules prepared to implement resulting regulations is conducted by staff at NOAA Fisheries Service Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

8.9 Regulatory Flexibility Analysis

The purpose of the Regulatory Flexibility Act is to reduce the impacts of burdensome regulations and recordkeeping requirements on small businesses. To achieve this goal, the Regulatory Flexibility Act requires Federal agencies to describe and analyze the effects of proposed regulations, and possible alternatives, on small business entities. To this end, this document contains an Initial Regulatory Flexibility Analysis, found at section 12.0 at the end of this document, which includes an assessment of the effects that the proposed action and other alternatives are expected to have on small entities.

8.10 E.O. 12866 (Regulatory Planning and Review)

The purpose of E.O 12866 is to enhance planning and coordination with respect to new and existing regulations. This E.O. requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be significant. Section 12.0 at the end of this document represents the Regulatory Impact Review, which includes an assessment of the costs and benefits of the proposed action, in accordance with the guidelines established by E.O. 12866. The analysis included in the Regulatory Impact Review shows that this action is not a significant regulatory action because it will not affect in a material way the economy or a sector of the economy

8.11 E.O. 13132 (Federalism)

This E.O. established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. The E.O. also lists a series of policy making criteria to which Federal agencies must adhere when formulating and implementing policies that have federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed measures. This action does not contain policies with federalism implications sufficient to warrant preparation of an assessment under E.O. 13132. The affected states have been closely involved in the development of the proposed management measures through their representation on the Council (all affected states are represented as voting members of at least one Regional Fishery Management Council). No comments were received from any state officials relative to any federalism implications that may be associated with this action

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10.0 LIST OF AGENCIES AND PERSONS CONSULTED

In preparing this annual specifications analysis the Council consulted with the NMFS, New England and South Atlantic Fishery Management Councils, Fish and Wildlife Service, Department of State, and the states of Maine through Florida through their membership on the Mid-Atlantic, New England and /or South Atlantic Fishery Management Councils. In addition, states that are members within the management unit were be consulted through the Coastal Zone Management Program consistency process. Letters were sent to each of the following states within the management unit reviewing the consistency of the proposed action relative to states' Coastal Zone Management Programs: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia and Florida.

11.0 LIST OF PREPARERS AND POINT OF CONTACT

This environmental assessment was prepared by the following member of the Council staff: Jason Didden. Questions about this environmental assessment or additional copies may be obtained by contacting Jason Didden, Mid-Atlantic Fishery Management Council, 800 N. State Street, Dover, DE 19901 (302-674-2331). This Environmental Assessment may also be accessed by visiting the NMFS Northeast Region website at http://www.nero.noaa.gov/regs/.

12.0 INITIAL REGULATORY FLEXIBILITY ANALYSIS & REGULATORY IMPACT REVIEW FOR THE 2012 CATCH SPECIFICATIONS FOR ATLANTIC MACKEREL, SQUID, AND BUTTERFISH

12.1 INTRODUCTION

The applicable laws pertaining to this action are summarized above in Section 8. E.O. 12866 requires the preparation of a Regulatory Impact Review for all regulatory actions that either implement a new FMP or significantly amend an existing plan or regulation. The Regulatory Impact Review is part of the process of preparing and reviewing FMPs and provides a comprehensive review of the changes in net economic benefits to society associated with regulatory actions. The analysis also provides a

review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems. The purpose of the analysis is to ensure that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way.

Purpose of and Need for the Action

The purposes (objectives) of this action are to establish annual quotas and other measures, where necessary, that will meet the need to prevent overfishing and achieve optimum yield. Optimum yield is defined as the amount of fish which will provide the greatest overall benefit to the Nation in terms of food production and recreational opportunities and is based on the maximum sustainable yield for each managed species. Failure to implement the preferred measures described in this document could result in overfishing and stock depletion or failure to reach optimum yield.

Regulations at 50 CFR Part 648 stipulate that the Secretary will publish a notice specifying the initial annual amounts of the initial optimum yield (IOY) as well as the amounts for allowable biological catch (ABC) domestic annual harvest (DAH), domestic annual processing (DAP), joint venture processing, and total allowable levels of foreign fishing (TALFF) for the species managed under the MSB FMP. The term IOY is used in these fisheries to reinforce the fact that the Regional Administrator may alter this specification up to the ABC if economic and social conditions warrant an increase. Therefore, this specification is no different than optimum yield.

Current regulations allow for the specification of measures for a period of up to three years (subject to annual review). However, the Council has chosen to specify the butterfish measures for one year and the other species are in the middle of the multi-year specifications cycle.

Amendment 14 added specifying an annual river herring and shad cap as part of the annual mackerel specifications. Accordingly, this document considers a range of river herring and shad caps.

Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

This action does not contain new collection-of-information, reporting, recordkeeping, or other compliance requirements. It does not duplicate, overlap, or conflict with any other Federal rules.

12.2 EVALUATION OF E.O.12866 SIGNIFICANCE

The proposed action does not constitute a significant regulatory action under Executive Order 12866 for the following reasons. (1) It will not have an annual effect on the economy of more than $100 million. Based on unpublished NMFS preliminary data (Maine-North Carolina) the total commercial value for the Atlantic mackerel, squid and butterfish fisheries combined was estimated at $48 million in 2012 so the measures considered in this regulatory action should not affect total revenues generated by the commercial industry to the extent that a $100 million annual economic impact will occur (especially since the proposed specifications could allow the previous year's landings to occur again or increase). The proposed actions are necessary to maintain the harvest of Atlantic mackerel, squid and butterfish at sustainable levels. The proposed action benefits in a material way the economy, productivity, competition and jobs. The proposed action will not adversely affect, in the long-term, competition, jobs, the environment, public health or safety, or state, local, or tribal government

communities. (2) The proposed actions will not create a serious inconsistency or otherwise interfere with an action taken or planned by another agency. No other agency has indicated that it plans an action that will affect the Atlantic mackerel, squid and butterfish fisheries in the EEZ. (3) The proposed actions will not materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of their participants. (4) the proposed actions do not raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

A more detailed description of the economic concepts involved in this analysis can be found in "Guidelines for Economic Analysis of Fishery Management Actions" (US Dept of Commerce 2000 - http://www.nmfs.noaa.gov/sfa/RFA%20Guidelines.PDF), as only a brief summary of key concepts will be presented here.

The law of demand states that price and quantity demanded are inversely related. Given a demand curve for a commodity (good or service), the elasticity of demand is a measure of the responsiveness of the quantity that will be taken by consumers giving changes in the price of that commodity (while holding other variables constant). Price elasticity of demand is elastic when a change in quantity demanded is large relative to the change in price. Price elasticity of demand is inelastic when a change in quantity demanded is small relative to the change in price. Price elasticity of demand is unitary when a change in quantity demanded and price are the same.

There are several major factors that influence the elasticity for a specific commodity. These factors largely determine whether demand for a commodity is price elastic or inelastic: 1) the number and closeness of substitutes for the commodity under consideration, 2) the number of uses to which the commodity can be put; and 3) the price of the commodity relative to the consumer's purchasing power (income). There are other factors that may also determine the elasticity of demand but are not mentioned here because they are beyond the scope of this discussion. As the number and closeness of substitutes and/or the number of uses for a specific commodity increase, the demand for the specific commodity will tend to be more elastic. Demand for commodities that take a large amount of the consumer's income is likely to be elastic compared to services with low prices relative to the consumer's income. It is argued that the availability of substitutes is the most important of the factors listed in determining the elasticity of demand for a specific commodity (Leftwich 1973; Awk 1988). Seafood demand in general appears to be elastic. In fact, for most species, product groups, and product forms, demand is elastic (Asche and Bjørndal 2003).

Benefit-cost analysis is conducted to evaluate the net social benefit arising from changes in consumer and producer surpluses that are expected to occur upon implementation of a regulatory action. Total Consumer Surplus (CS) is the difference between the amounts consumers are willing to pay for products or services and the amounts they actually pay. Thus CS represents net benefits to consumers. When the information necessary to plot the supply and demand curves for a particular commodity is available, consumer surplus is represented by the area that is below the demand curve and above the market clearing price where the two curves intersect. Since an empirical model describing the elasticities of supply and demand for these species is not available, it was assumed that the price for these species was determined by the market clearance price market or the interaction of the supply and demand curves. These prices were the base prices used to determine potential changes in prices due to changes in landings.

Net benefit to producers is producer surplus (PS). Total PS is the difference between the amounts producers actually receive for providing goods and services and the economic cost producers bear to do so. Graphically, it is the area above the supply curve and below the market clearing price where supply and demand intersect. Economic costs are measured by the opportunity cost of all resources including the raw materials, physical and human capital used in the process of supplying these goods and services to consumers.

One of the more visible costs to society of fisheries regulation is that of enforcement. From a budgetary perspective, the cost of enforcement is equivalent to the total public expenditure devoted to enforcement. However, the economic cost of enforcement is measured by the opportunity cost of devoting resources to enforcement vis-à-vis some other public or private use and/or by the opportunity cost of diverting enforcement resources from one fishery to another.

Alternatives - Tables 1 and 2 above are reproduced below to provide a review of the status quo and preferred alternatives considered in the proposed action. Additional details and the non-preferred alternatives can be found in Section 5.

Table 42. Expected impacts of status quo and preferred specifications.
("+" signifies a positive impact, "-" a negative impact, and "0" a similar impact to the year before. "0/" before "+" or "-" indicates a likely small impact; Impacts for non-preferred alternatives are discussed in Section 7)

	Valued Ecosystem Components/Environmental Dimensions				
Specification Alternatives - JVP and TALFF are not listed in the table because they are both zero throughout. DAHs may be reduced to provide RSA quota as described in this document.	Managed Resource	Non-target Species	Human Communi-ties	Protected Resources	Essential Fish Habitat
Alt 4a - Butterfish No Action/Status Quo - ABC = 8,400mt; DAH = 2,570 mt; Butterfish Cap = 3,884mt	0	0	0	0	0
Alt 4b - Butterfish Preferred - ABC = 9,100mt; DAH = 3,200mt; Butterfish Cap = 3,884mt	0	0/-	+	0/-	0/-

Table 43. Expected impacts of status quo and preferred other management measures.
("+" signifies a positive impact, "-" a negative impact, and "0" a similar impact to the year before. "0/" before "+" or "-" indicates a likely small impact; Impacts for non-preferred alternatives are discussed in Section 7)

	Valued Ecosystem Components/Environmental Dimensions				
Management measures besides specifications.	Managed Resource	Non-target Species	Human Communi-ties	Protected Resources	Essential Fish Habitat
Alt 1a - Status Quo/No Action - No RH/S Cap	0	0	0	0	0
Alt 1b - Preferred - 236 mt RH/S Cap	0	+	mixed	0/+	0
Alt 2a - Status Quo/No action -No changes to post closure longfin trip limits for *Illex* fishing	0	0	0	0	0
Alt 2b - Preferred - 15,000 pound longfin trip limit post Trimester 2 closure for Illex fishing	0	0	0/+	0	0
Alt 3a - Status Quo/No Action - No change to butterfish Phase 3 trip limit (500 pounds)	0	0	0	0	0
Alt 3b - Preferred -Change butterfish Phase 3 trip limit to 600 pounds (from 500)	0	0	0/+	0	0

Atlantic mackerel

The cap (Alternative Set 1) for river herrings and shads (RH/S) could cause an in-season closure for the mackerel fishery. However, recent landings of mackerel have been low and erratic. It is likely that environmental conditions are much more likely to influence landings. Also, mackerel enter a world mackerel market and U.S. landings are not likely to impact price within the range of zero catch to full quota utilization. Neither harvest costs nor enforcement should not be impacted by this action. Producer and Consumer Surplus would thus both be reduced if less mackerel is available to be caught, but the change is not possible to predict. These losses may be offset if constraining mackerel effort leads to improved RH/S stocks, which also provide benefits to the nation.

Illex Squid

No actions are considered relative to *Illex* squid.

Alternatives for butterfish

The alternatives considered for Atlantic mackerel specifications for 2014 are fully described in section 5. Up to 3% of the ACT may be set aside for scientific research. Due to a lack of an empirical model for these fisheries and knowledge of elasticities of supply and demand, a qualitative approach to the economic assessment was used.

Landings

The preferred specifications for 2014 would allow an increase in landings.

Prices

While some additional landings may go into the fresh fish market, most of the additional landings are expected to go into a frozen export market. This export market does not exist now. Given the absorption by the export market of most of any increase in landings, prices may not be impacted substantially in the fresh market. If the higher quota translates into much greater fresh market landings, this could exert downward price pressure.

Consumer Surplus

Assuming butterfish prices will not be affected under the alternatives considered there should be no corresponding change in consumer surplus associated with these alternatives related to price. Lower prices would increase consumer surplus and the higher amount of product available could increase consumer surplus.

Harvest Costs

Harvest costs should not be impacted.

Producer surplus

Assuming the fresh fish market prices will not be affected under the alternatives considered, there should be no corresponding change in producer surplus associated with these alternatives for that

market related to price. If price falls there could be some per unit loss in producer surplus but that could be made up by the higher allowed landings. Fish that go into the frozen export market should increase producer surplus regardless of the price as long as the fish is sold at a profit since this market does to exist currently. Lower harvest costs would also increase producer surplus.

Enforcement Costs

The alternatives considered are not expected to change enforcement costs.

Distributive Effects

No measures are considered that appear likely to have distributive effects.

One alternative increases the butterfish Phase 3 trip limit to 600 pounds (3b) but it should have no impacts other than to reduce regulatory confusion by matching the general incidental trip limit to the Phase 3 trip limit.

Alternatives for Longfin Squid

The only alternative pertinent to longfin squid would reduce regulatory discarding (2b, which increases the limit for *Illex* vessels during longfin squid directed fishery closures to 15,000 pounds) but should have no other impacts.

Summary of Impacts

The overall impacts of Atlantic mackerel, longfin squid, *Illex* and butterfish landings on prices, consumer surplus, and consumer surplus are difficult to determine without detailed knowledge of the relationship between supply and demand factors for these fisheries. In the absence of detailed empirical models for these fisheries and knowledge of elasticities of supply and demand, a qualitative approach was employed to assess potential impacts of the management measures, which appear to be positive. The Council has concluded that no change in the competitive nature of these fisheries should result from implementation of the quota specifications under the preferred alternatives. No negative changes in enforcement costs or harvest costs have been identified for any of the alternatives considered for each species. Section 7 of this Environmental Assessment also has a description of the cumulative impacts of the measures established under the FMP since it was implemented.

12.3 ANALYSIS OF IMPACTS

12.3.1 INTRODUCTION AND METHODS INCLUDING NUMBER OF REGULATED ENTITIES

The Regulatory Flexibility Act requires the Federal rulemaker to examine the impacts of proposed and existing rules on small businesses, small organizations, and small governmental jurisdictions. In reviewing the potential impacts of proposed regulations, the agency must either certify that the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities or prepare a final regulatory flexibility analysis. The Small Business Administration defines a small business in the commercial fishing sector as a firm with receipts (gross revenues) of up to $19.0 million. Party/charter small businesses are included in NAICS code 487210 and are defined as a firm with gross receipts of up to $7 million.

The measures regarding the 2014 quotas could affect any vessel holding an active Federal permit for Atlantic mackerel, longfin squid, *Illex* or butterfish, as well as vessels that fish for any one of these species in state waters. According to NMFS permit file data 2,441 commercial or charter vessels possessed MSB permits on August 14, 2013. The combined values of all four mackerel, squid (2) and butterfish fisheries were approximately $48, $44, and $32 million for 2012, 2011, and 2010. While no MSB vessels total $19 million in revenues from MSB fishing, some vessels are engaged in multiple fisheries, and some vessels are owned by a single vertically-integrated owner, so theoretically there may be a few vessels with MSB permits that do not qualify as small businesses in a given year, but it is likely that almost all do. Many of these vessels do not land MSB species in a given year, but since they hold permits and could catch MSB species in 2014 they are included in the total potentially impacted businesses. There are also some vessels that fish for these species in state waters that hold no federal permits but if they hold no federal permits they should not be substantially impacted by these federal actions.

Not all landings and revenues reported through the Federal dealer data can be attributed to a specific vessel. Vessels with no Federal permits are not subject to any Federal reporting requirements with which to corroborate the dealer reports. Thus, it is possible that some vessel activity cannot be tracked with the landings and revenue data that are available. Thus, these vessels cannot be included in the threshold analysis, unless each state were to report individual vessel activity through some additional reporting system - which currently does not exist. This problem has two consequences for performing threshold analyses. First, the stated number of entities subject to the regulation is a lower bound estimate, since vessels that operate strictly within state waters and sell exclusively to non-Federally permitted dealers cannot be counted. Second, the portion of activity by these uncounted vessels may cause the estimated economic impacts to be over- or underestimated. However, vessels with no federal permits should not be substantively impacted by these federal management measures.

The effects of actions were analyzed by employing quantitative approaches to the extent possible. In the current analysis, effects on profitability associated with the management measures should be evaluated by looking at the impact the measures on individual vessel costs and revenues. However, in the absence of cost data for individual vessels engaged in these fisheries, changes in gross revenues are used a proxy for profitability.

12.3.2 ANALYSIS OF THE IMPACTS OF ALTERNATIVES

12.3.2.1 Impacts of Alternatives for Atlantic mackerel

No changes are proposed for mackerel specifications. Mackerel abundance and availability will likely drive landings and revenues more than any regulation, since the current and proposed quotas have not been achieved in recent years. It is not believed that any regulations stemming from the MSB FMP are restricting catches but rather that abundance and availability are currently the primary determinant of mackerel landings and revenues. The RH/S cap has the potential to limit the fishery from achieving its full quota if RH/S encounter rates are high, but it is very unlikely that the fishery would close before exceeding the levels of landing experienced since 2010, when landings have been less than 11,000 mt. Limiting catches of river herring and shad has the potential to benefit those species. However the extent of any benefit cannot be determined because overall abundance information for river herring and shad is not available.

12.3.2.2 Impacts of Alternatives for butterfish

The alternatives considered for this species are fully described in section 5. Changes in the butterfish ABC, ACT, and ACL have two possible economic effects. The first potential effects are the direct changes in revenues. The second set of potential effects are related to the "shadow value" of butterfish for the longfin squid fishery (longfin Squid and butterfish are often caught together). Because of the butterfish cap, a constraint on total butterfish catch may limit production in the squid fishery, so butterfish takes on a "shadow value" in terms of the indirect impact on the longfin squid fishery. Since the proposed specifications are not likely to cause a reduction in revenues from the status quo and could in fact raise revenue, the 2014 specifications are not expected to have substantial negative impacts on businesses involved in this fishery as compared to 2013 or other recent years. There is also a regulatory change to slightly raise a trip limit for the sake of regulatory simplicity (detailed above), which should not have any negative effects.

12.3.2.3 Impacts of Alternatives for Longfin squid

The only change proposed for longfin squid is a regulatory changes that would allow more longfin squid to be retained during closures of Trimester 2 by vessel that are fishing for *Illex* (detailed above). This change should reduce the chances for regulatory discarding, and provide a small amount of additional revenue. Since the degree to which regulatory discarding is currently occurring is not known, it is not possible to quantify the potential additional revenues. However, retaining 15,000 pounds of longfin squid compared to 2,500 pounds of longfin squid could potentially result in an additional 12,500 pounds of longfin squid per applicable *Illex* trip. If longfin squid prices were $1/pound (they averaged $1.09/pound in 2012), then each applicable *Illex* trip could theoretically increase revenues by $12,500 per trip. However, longfin squid must first be closed during Trimester 2 for this to apply, and not all *Illex* trips will encounter substantial longfin squid.